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Report of the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes*

Note by the Secretariat

The Secretariat has the honour to transmit to the Human Rights Council the report of the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes, prepared pursuant to Council resolution 36/15.

In accordance with the mandate, in the present report the Special Rapporteur examines the situation of workers implicated and affected by occupational exposure to toxic and otherwise hazardous substances worldwide. He proposes principles intended to help States, businesses and other key actors respect and protect workers from toxic occupational exposures and to provide remedies for violations of their rights.

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I. Introduction

1. Everyone has the right to just and favourable conditions of work.[1] Every worker has a right to dignity, to be treated ethically, with respect and without being subjected to conditions of work that are dehumanizing or degrading. States have undertaken an ambitious goal under the Sustainable Development Goals: to ensure decent work for all by 2030.[2]

2. Despite clear obligations relating to the protection of workers' health, workers around the world find themselves in the midst of a public health crisis due to their exposures to hazardous substances at work. While the World Health Organization (WHO), the International Labour Organization (ILO) and others have called for action on this public health crisis for decades, the global problem of workers' exposure to hazardous substances remains poorly addressed.

3. It is estimated that one worker dies every 15 seconds from toxic exposures at work,[3] while over 2,780,000 workers globally die from unsafe or unhealthy conditions of work each year.[4] Occupational diseases account for 2.4 million (over 86 per cent) of total premature deaths.[5] An "occupational disease" is any disease contracted primarily as a result of an exposure to risk factors arising from work activity, including chronic exposure to toxic industrial chemicals, pesticides or other agricultural chemicals, radiation and dust, among other hazards.[6] Approximately 160 million cases of occupational disease are reported annually.[7] Inaction by States and businesses on this global public health crisis is estimated to cost nearly 4 per cent of global gross domestic product, or virtually $3 trillion.[8]

4. Cancers account for over 70 per cent of occupational diseases globally and are estimated to cause the deaths of at least 315,000 persons annually;[9] 5.3–8.4 per cent of all cancers, and 17–29 per cent of deaths from lung cancer among men, are attributed to occupational exposure to toxic substances.[10] Almost all such cancers can be prevented.[11] More than 200 different known factors, including toxic chemicals and radiation, have been identified to date as known or probable human carcinogens, and workers are exposed to many of these in the course of their jobs.[12]

5. Debilitating and fatal lung diseases, neurological disabilities and reproductive impairments such as infertility and inability to carry a pregnancy to term are among various other health impacts that plague workers exposed to toxic substances. Occupational exposures result in 12 per cent of deaths from chronic obstructive pulmonary disease and it

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[1] Universal Declaration of Human Rights, art. 23.

[2] See ILO, "Decent work and the 2030 Agenda for Sustainable Development", 2 November 2017. United Nations human rights mechanisms define "decent work" as "work that respects the fundamental rights of the human person as well as the rights of workers in terms of conditions of work safety and remuneration". Committee on Economic, Social and Cultural Rights, general comment No. 18 (2005) on the right to work.

[3] Päivi Hämäläinen, Jukka Takala and Tan Boon Kiat, *Global Estimates of Occupational Injuries and Work-related Illnesses 2017* (Singapore, Workplace Safety and Health Institute).

[4] Ibid.

[5] Ibid.

[6] WHO, "Occupational and work-related diseases" (n.d.).

[7] International Trade Union Confederation, Toxic Work: Stop Deadly Exposures Today!, 13 April 2015.

[8] Gerry Eijkemans, "The importance of workers' health to advance the United Nations Sustainable Development Agenda", *Occupational & Environmental Medicine*, vol. 75, Supp. 2 (April 2018); ILO, "Global action needed to tackle rising work-related injuries and diseases, ILO says", 7 September 2017.

[9] ILO, *Promoting Decent Work in the Chemical Industry: Innovative Initiatives* (Geneva, 2013), p. 20.

[10] Jukka Takala and others, "Eliminating occupational cancer in Europe and globally", OSHWiki, 30 May 2017.

[11] Ibid.

[12] WHO, International Agency for Research on Cancer, "IARC monographs on the evaluation of carcinogenic risks to humans", 29 June 2018. Available at https://monographs.iarc.fr/agents-classified-by-the-iarc/.

is estimated that an additional 29,000 deaths are due to the occupational diseases silicosis, asbestosis and pneumoconiosis.[13]

6. Due to differences in social roles, including occupational and household roles, women and men are exposed differently to toxic chemicals with respect to, among other things, the substances encountered and the degree of exposure. Biological differences between men and women, such as physiological and hormonal differences, create differing susceptibilities to the effects of exposure.[14] For example, women are more likely to store higher levels of environmental pollutants in their adipose tissues than men. During pregnancy, lactation and menopause, women's bodies undergo changes that may increase their susceptibility to health impacts from toxic exposures.

7. Of particular concern is the exposure to toxic chemicals of workers who are women of reproductive age. Protecting only pregnant women from exposure is insufficient because a developing fetus can be harmed by exposures that preceded knowledge of the pregnancy. Adverse health effects, especially in expectant mothers and the fetus but also for the workforce at large, occur at extremely low levels of exposure. As evidence of adverse effects accumulates, "safe" levels of exposure are continually revised downward and children continue to be born with a host of adverse health outcomes due in particular to the exposure of their mothers to toxic chemicals during pregnancy (A/HRC/33/41).[15]

8. Official statistics are likely to underestimate the extent of the problem. For example, incidences of exposure are grossly underreported in some contexts and countries.[16] As official incidence rates are based on reported data, an advanced country such as Finland may show a higher incidence of occupational disease than a country such as India, merely because of the former country's greater facility to diagnose and identify occupational exposure as the source of a disease. Furthermore, some countries have no legal definition or reference list of occupational diseases to facilitate reporting the incidence of diseases and deaths from specific causes. Major occupational diseases such as chronic obstructive pulmonary disease may not be well recognized and tend to be underdiagnosed.[17] Moreover, and importantly, self-employed workers, subsistence farmers and workers in the informal economy are rarely captured in national statistics. The informal workforce comprises a large portion of the global workforce and accounts for the majority of workers in certain countries, the largest and most populous of which are in less-developed regions.[18] As many countries have inadequate capacity to collect information on causes of death, information on the disease and death patterns must be estimated.

9. Virtually every sector is implicated in this public health crisis, including both public and private sectors and the world's most economically powerful industries. Many of these industries have — by their own design — vast and opaque supply chains, including links to the informal economy. Some of these business enterprises are not obviously implicated, for example a financial institution that trades gold mined using toxic mercury, resulting in severe impacts on informal workers and their children. A small selection of cases addressed by the mandate in recent years is provided in the annex to the present report.

10. In his report the Special Rapporteur analyses the human rights of workers implicated and affected by their occupational exposure to toxic and otherwise hazardous substances (toxic substances),[19] followed by a summary of current challenges facing workers in the

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[13] WHO, *Global Health Risks: Mortality and Burden of Disease Attributable to Selected Major Risks* (Geneva, 2009), p. 25.

[14] United Nations Development Programme (UNDP), *Chemicals and Gender*, 2011.

[15] See also WHO, *Summary of Principles for Evaluating Health Risks in Children Associated with Exposure to Chemicals* (Geneva, 2011).

[16] ILO, "World Statistic: The enormous burden of poor working conditions" (n.d.).

[17] Hämäläinen, p. 17.

[18] Ibid., p. 7.

[19] Consistent with the previous reports of the current mandate holder and those of his predecessors, hazardous substances and wastes are not defined strictly; they include, inter alia, toxic industrial chemicals and pesticides, pollutants, contaminants, explosive and radioactive substances, certain food additives and various forms of waste. For ease of reference the Special Rapporteur refers to hazardous

global economy. The Special Rapporteur concludes with proposed principles to respect and protect the rights of workers implicated by toxic occupational exposures and to ensure effective remedies for violations or abuses.

11. For the purpose of the report, the term "workers" includes not only directly employed workers but also informal workers, as well as contract workers, subcontractors, agency workers and all other persons performing work or work-related activities.

12. For over 20 years, United Nations human rights bodies have mandated a special rapporteur to monitor and report on the human rights implications of exposure to hazardous substances and toxic wastes in various industries worldwide, including in relation to workers.

13. The present report is part of an ongoing effort by the current mandate holder to improve the integration of human rights into occupational safety and health discussions at the national and international levels. The Special Rapporteur believes that the importance of the issue has been largely forgotten and deprioritized in relevant international forums, resulting in a lack of global progress in confronting the growing concern.

II. Human rights of workers and exposure to toxic substances

14. Workers' rights are human rights, and human rights are workers' rights. These rights are interrelated, indivisible and universal. They include civil, political, economic, social and cultural rights. No one can be deprived of these human rights because of the work they perform.

15. Workers are especially vulnerable to the violation and abuse of their human rights, not the least of which is from being subjected to exposure to toxic substances in the course of their work. The harms of chronic exposures are often invisible, and it may be years or even decades until adverse health impacts become manifest in workers or their children. Prevention of exposure to toxic substances is essential to protect human rights, including the rights of workers.

A. Right to safe and healthy working conditions

16. The right to just and favourable working conditions, enshrined in the Universal Declaration of Human Rights (art. 23) and again in the International Covenant on Economic, Social and Cultural Rights (art. 7), includes the right to safe and healthy working conditions. By separately stipulating the right of workers to safe and healthy working conditions, the Covenant recognizes and emphasizes the vulnerability of workers to violations and abuses of their rights. This vulnerability heightens the obligations of States and other parties to prevent institutionalized exploitation of workers due to hazardous work.

17. The right to safe and healthy work is a right in itself; however, it also encompasses many other interrelated and interdependent human rights of workers, including the rights described below.

18. Everyone, including workers in both formal and informal settings, has the inherent right to life[20] and the right to enjoy the highest attainable standard of physical and mental health.[21] States have a clear obligation to adopt preventive measures to protect both the

substances and wastes as "toxics", but the term as used in the report includes non-toxic but hazardous substances and wastes as well.

[20] International Covenant on Civil and Political Rights, art. 6.

[21] International Covenant on Economic, Social and Cultural Rights, art. 12.

right to life [22] and the right to health, including provisions for "healthy working conditions".[23]

19. The Committee on Economic, Social and Cultural Rights clarifies that States have a duty to improve all aspects of industrial hygiene. This includes "preventive measures in respect of occupational accidents and diseases ... [and] the prevention and reduction of the population's exposure to harmful substances such as radiation and harmful chemicals ... that directly or indirectly impact upon human health". [24]

20. Everyone, including workers, has the right to physical integrity of their body.[25] This right encompasses the right of each human being to autonomy and self-determination over their own body, including over the entry of unwanted, toxic substances into their body, whether from occupational or other sources. Acute poisonings and other cases of extreme exposure to toxic substances present unquestionable violations of the right of workers to physical integrity, subjecting them to violent, cruel, inhuman and degrading forms of treatment. However, this right also extends to longer-term exposure to toxic substances, which can also give rise to violent, cruel, inhuman and degrading outcomes (A/HRC/22/53 and A/HRC/33/41).

21. Furthermore, workers have a right not to be subjected to scientific experimentation without their consent. [26] The exposure of workers to substances without sufficient information about whether they can cause cancer or harm a developing fetus when such information can be made available and accessible raises concerns that workers have been and continue to be subjected to a form of human experimentation. This right illustrates the importance of the right to information to enable the realization of the human rights of workers.

22. Under the rubric of the right to safe and healthy working conditions, the exposure of workers to toxic substances without their prior informed consent, with the real possibility of refusing to perform the hazardous activity, should be recognized as a violation and abuse of their rights. This is an essential part of the right of every worker to be protected from unsafe and unhealthy working conditions. The Special Rapporteur believes that every worker has an inherent right not to be exposed to toxic substances without their prior informed consent. In his view, this right is at the crux of the right to physical integrity, the right to information and the right not to be subjected to scientific experimentation without consent.

23. The ILO Promotional Framework for Occupational Safety and Health Convention, 2006 (No. 187) recognizes the right of workers to safe and healthy working conditions, although ILO does not include this right as a "fundamental right at work". ILO implicitly recognizes the right of workers not to be exposed without their prior informed consent through recognition of the worker's "right to remove themselves from danger resulting from the use of chemicals when they have reasonable justification to believe there is an imminent and serious risk to their safety or health". [27] ILO has issued relevant recommendations to States, e.g. to put in place national policies, systems and programmes to prevent "occupational injuries, diseases and deaths ... for the protection of all workers, in particular, workers in high-risk sectors, and vulnerable workers such as those in the informal economy and migrant and young workers".[28]

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[22] Human Rights Committee, general comment No. 6 (1982) on the right to life.

[23] Committee on Economic, Social and Cultural Rights, general comment No. 14 (2000) on the highest attainable standard of health.

[24] Ibid.

[25] These fundamental rights also include respect for the physical and mental integrity of the worker in the exercise of his/her employment. Committee on Economic, Social and Cultural Rights, general comment No. 18.

[26] International Covenant on Civil and Political Rights, art. 7.

[27] Chemicals Convention, 1990 (No. 170), art. 18.

[28] Promotional Framework for Occupational Safety and Health Recommendation, 2006 (No. 197); see also the ILO Constitution.

B. Rights to information, participation and association

24. Everyone, including workers, has the inalienable rights to freedom of expression, assembly and association, including the freedom to join and form trade unions, and the right to information.[29]

25. The right to information is the foundation for the realization of all workers' rights regarding toxic exposures. As mentioned above, the right to information is indivisible from the worker's right to not be exposed to toxic substances without their prior informed consent. Workers have the right to know, inter alia, the implications of exposure, the action being taken to prevent exposure and their rights in relation to such exposures.

26. Public frameworks for collecting, measuring, monitoring, reporting and verifying information on hazards and exposure levels are necessary for evaluating and analysing health implications and accountability. Maintaining disaggregated, accurate and complete information is necessary to understand specific events and for accurate knowledge of the impact of particular actions on various workers as well as on other exposed groups including children, women of reproductive age, migrant workers and their families, older persons and persons with disabilities.

27. ILO recognizes several aspects of the worker's (and their representative's) right to know in its conventions, as well as of the duties of States and the responsibilities of employers' businesses, including chemical suppliers.[30] For example, concerned workers and their representatives have the right to "information on the identity of chemicals used at work, the hazardous properties of such chemicals, precautionary measures, education and training".[31] However, while the Chemicals Convention calls for the classification of chemicals according to their potential health hazard (art. 6), it requires suppliers merely to assess the properties of these substances "on the basis of a search of available information" (art. 9 (3)), i.e., the Convention does not require them to conduct tests to generate missing information relevant for such classification.

28. All health and safety information held by public bodies and business enterprises should be subject to disclosure, unless it falls within a narrow set of public-interest limitations such as the protection of privacy or public health (see A/HRC/30/40, paras. 38 and 101 (b)). It is never legitimate for States or businesses to refuse to disclose health and safety information on the grounds that it is confidential, particularly on the grounds that it would adversely affect profits or competitiveness (ibid., para. 42). To this end, international agreements on toxic chemicals have repeatedly stipulated that health and safety information about toxic substances shall not be regarded as confidential.[32]

29. Workers defending their right to safe and healthy work, among other rights, find strength in numbers. Strong protections for the right to organize, including the formation of unions, the right to freedom of association and the right to collective bargaining, have proven effective in strengthening protections for workers from exposure to toxic substances as well as other risks. For example, the strength of unions led to the phasing out of tobacco smoking from indoor spaces. ILO conventions provide for these rights, which it considers to be fundamental rights at work.

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[29] Universal Declaration of Human Rights, art. 24; International Covenant on Civil and Political Rights, arts. 19, 22 and 25; International Convention on the Rights of All Migrant Workers and Members of Their Families, art. 26.

[30] Chemicals Convention, art. 18; Prevention of Major Industrial Accidents Convention, 1993 (No. 174), art. 20; Safety and Health in Mines Convention, 1995 (No. 176), art. 13 (1) (c); and Safety and Health in Agriculture Convention, 2001 (No. 184), art. 8 (1) (a).

[31] Chemicals Convention, art. 18 (3).

[32] Stockholm Convention on Persistent Organic Pollutants, art. 9; Minamata Convention on Mercury, art. 17. See also Dubai Declaration on International Chemicals Management.

C. Rights of workers at heightened risk

30. Workers, like all human beings, are born free and equal in their rights.[33] Often, it is persons living in situations that marginalize them and render them vulnerable to violations of their rights who are harmed by exposure to toxic substances. Yet everyone has the right to protection from discrimination and equal treatment before the law. No worker, or worker's child, should bear the burden of occupational disease or disability that can follow from discrimination on the grounds of age, income, race, religion, gender, country of origin, intelligence, political views or other distinction.

1. Rights of the child and women

31. Every child has the right to be free from the worst forms of child labour. Work where children use or are otherwise exposed to pesticides, toxic industrial chemicals, metals or other hazardous substances constitutes one of the worst forms of child labour (A/HRC/33/41). The Convention on the Rights of the Child recognizes the right of the child to be protected from performing any work that is likely to be hazardous or to be harmful to the child's health or physical development (art. 32). The Worst Forms of Child Labour Convention, 1999 (No. 182) identifies as the worst forms of child labour "work which, by its nature or the circumstances in which it is carried out, is likely to harm the health, safety or morals of children" (art. 3). Exposing children to toxic substances at work is indefensible.

32. Safeguarding reproductive health from hazardous working conditions is a core obligation of States in the elimination of discrimination against women in employment.[34] Women workers have a right to special protection during all periods that pose reproductive risks to them[35] as well as to their offspring, which requires protection from work that exposes them or their fetus to toxic chemicals.

33. At the same time, women should not be deprived of equal opportunities for employment or income. Of particular concern is that women workers are exposed to toxic substances at work before and during the earliest stages of pregnancy, even before they may know they are pregnant. This reality requires special care on the part of States and businesses to protect women's reproductive health by preventing their exposure to toxic substances without limiting employment in a discriminatory fashion. The best means of doing so is by eliminating toxic substances at work.

2. Rights of migrant workers and workers with disabilities

34. The prohibition against racial discrimination applies in all its forms. Race or ethnicity should likewise not be a prohibiting factor in the realization by workers of the right to safe and healthy working conditions.[36] Migrant workers, whether documented or undocumented, have a right to equality and to enjoy equal treatment to nationals regarding safety and health and other conditions of work.[37] Persons with disabilities have the right, on an equal basis with others, to safe and healthy working conditions and related human rights.[38]

D. Right to an effective remedy

35. Accountability is a fundamental principle of human rights. States and other duty bearers must be answerable to workers, among other rights holders, for observing human rights obligations. The right to an effective remedy is inseparable from the right to information, as effective remedies for exposure to toxic substances depend on the

[33] Universal Declaration of Human Rights, art. 1.
[34] Convention on the Elimination of All Forms of Discrimination against Women, art. 11 (1) (f).
[35] *Ibid.*, art. 11 (2) (d).
[36] International Convention on the Elimination of All Forms of Racial Discrimination, art. 5 (d) (i).
[37] International Convention on the Rights of All Migrant Workers and Members of Their Families, art. 25 (1) (a).
[38] Convention on the Rights of Persons with Disabilities, art. 27.

availability and accessibility of certain information regarding such substances and working conditions (A/HRC/30/40).

36. All workers who are victims of infringement or violations of their rights have the right of access to an effective remedy.[39] Effective remedies for violations of workers' rights due to exposure to toxic substances include the right of victims to prompt restitution, compensation, rehabilitation, satisfaction and guarantees of non-repetition, as well as bringing to justice the perpetrators of rights violations.[40] The prevention of future exposures is common to many of the elements of an effective remedy in this regard.

37. Every rights holder is entitled to initiate proceedings for appropriate redress before a competent court or other adjudicator in accordance with the rules and procedures provided by law. States must ensure timely access to effective remedies to victims of violations occurring from exposure to hazardous chemicals (see E/CN.4/2006/42, para. 45). In various circumstances, States have shifted the burden of proof to the employer or other beneficiary of services.[41] In other cases, judicial and non-judicial mechanisms have lessened the burden of proof on workers to help ensure access to remedies.[42]

III. Challenges to the rights of workers affected by toxic exposures

A. Inadequate standards of protection

38. Laws and policies for occupational health are often not health protective. They continue to permit workers to be exposed to toxic substances at levels that are hundreds if not thousands of times higher than for non-workers in the same jurisdiction.[43] Risk assessments are often based on incomplete knowledge or false assumptions, resulting in misleading assurances of safety and widespread impacts on workers' health. Processes for improving standards of protection from exposure continue to be deliberately delayed for years if not decades, resulting in countless premature deaths.

B. Limited progress in preventing exposure

39. The most effective means to prevent exposure of workers to toxic substances is to eliminate them from the workplace. This is reflected in the good practice known as the hierarchy of hazard controls, or "inherently safer design", encouraged by ILO and national bodies concerned with occupational safety and health.[44] In descending order of effectiveness in terms of preventing exposure, elimination is followed by risk mitigation options such as substitution with less hazardous substances and materials, engineering controls, administrative controls and the use of personal protective equipment.

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[39] International Covenant on Civil and Political Rights, art. 2 (3) (a); Committee on Economic, Social and Cultural Rights, general comment No. 3 (1990) on the nature of States parties' obligations; Guiding Principles on Business and Human Rights: Implementing the United Nations "Protect, Respect and Remedy" Framework.

[40] Basic Principles and Guidelines on the Right to a Remedy and Reparation for Victims of Gross Violations of International Human Rights Law and Serious Violations of International Humanitarian Law, paras. 11 and 15–23; Human Rights Committee, general comment No. 31 (2004) on the nature of the general legal obligation imposed on States parties to the Covenant, para. 16; and Convention on the Rights of the Child, art. 39.

[41] "Presumptive legislation for firefighter cancer", First Responder Center, 2017.

[42] Junius C. McElveen Jr., "Establishing proof of exposure", Lexology, 2012.

[43] Ted Smith and Chad Raphael, "Health and safety policies for electronics workers", in *The Routledge Companion to Labor and Media*, Richard Maxwell, ed. (Routledge, 2015), pp. 78–89 (citing Amanda Hawes).

[44] National Institute for Occupational Safety and Health, "Hierarchy of controls", Centers for Disease Control and Prevention, 11 May 2018.

40. Although examples of its application exist, the practice is of very limited application. Requiring the adoption of the hierarchy of controls as an international standard would level the playing field by harmonizing upwards. However, business actors continue to stifle global progress by insisting that applying the hierarchy will reduce competitiveness. Workers continue to be exposed to toxic substances, including toxic industrial chemicals and highly hazardous pesticides, when demonstrably less dangerous alternatives exist. Another egregious example of an industry that continues to externalize impacts on poor workers and communities in developing countries by failing to apply the hierarchy is the shipping industry and its practice of shipbreaking.

41. Business enterprises can develop and adopt alternatives that reduce harm to human health and the environmental impact of their operations and business relationships. Some have done so. However, many enterprises have outsourced and/or buried the problem of toxic exposure further down their global supply chains, enabling them to continue business as usual instead of adopting measures to respect workers' rights affected by toxic work, despite increasing expectations that business enterprises should prevent exposure to toxics as part of their human rights due diligence.

C. Monitoring and enforcement gaps

42. To ensure they are not turning a blind eye to the exploitation of workers, States must monitor working conditions, including routine monitoring of exposures, and enforce laws for the protection of workers' rights. However, the vast majority of States do not adequately perform their duties related to monitoring, oversight, protection or redress for workers whose rights are abused by their exposure to toxic substances in their jurisdiction. The systematic decline in funding for institutions responsible for monitoring [45] presents significant and enormous difficulties for States in monitoring the large number of workplaces in their jurisdiction and challenges persist in relation to the collection of statistical information, particularly with respect to the informal sector. In most countries, recording and notification of occupational accidents and, in particular, diseases is poorly done, not harmonized and significantly underreported.

D. Exploitation of those most at risk

43. Multiple factors such as social status, education, age, gender, country of origin, ethnicity or disability can exacerbate the risks in the exposure to toxics. Prevention and response to exposure must take into account these specific vulnerabilities to be effective.

44. Those most at risk of exposure are those who are most vulnerable to exploitation: the poor, children and women, migrant workers, people with disabilities and older persons. They are often prone to abuse of a myriad of human rights, they are forced to make the abhorrent choice between their health and income and their plight is invisible to most consumers and policymakers with the power to enable a just transition.

1. Poverty

45. Poverty is common among most workers whose rights are abused by their exposure to toxic chemicals. The disparity of exposure between low- and high-income workers is visible both within and between countries.

46. Very often low-income workers have lower educational levels that drive them to accept occupations that expose them to toxic chemicals, limit their access to information and knowledge and prevent them from being able to defend their rights. The impacts of occupational exposure of low-income workers to toxic substances are more likely to be attributed to other, non-work exposures that are higher in poorer communities such as air,

[45] ILO, *Report of the Committee of Experts on the Application of Conventions and Recommendations*, Report III (Part 1B), containing the General Survey on certain occupational safety and health instruments (Geneva, 2017), para. 436.

water and food contamination, or to lifestyle choices such as unhealthy diets and tobacco and other harmful substance use.

47. The economic insecurity of workers who are typically exposed to toxic substances is often exploited. The fear of job losses is often used to dissuade workers, regulators and politicians from improving protection of workers from exposure to toxic substances.

2. Women workers

48. Women comprise a significant proportion of workers in certain occupations and sectors, such as manufacturing and agriculture, as well as services and informal work, that carry a higher risk of toxic exposures (see, e.g., A/HRC/36/41). Gender-specific impacts are reported. Increasing evidence points to an association between breast cancer and occupational exposures to various pesticides, industrial chemicals and metals.[46] There are multiple examples of increased risk of miscarriages in the manufacture of electronics.[47] Women of reproductive age are often tasked with the use of toxic heavy metals such as mercury in artisanal gold mining, placing both themselves and future children at grave risk of health impacts.

3. Child labour

49. Children continue to be engaged in one of the worst forms of child labour where they use or are exposed to toxic substances at work. For various reasons, children are far more likely to be exposed to toxic substances and are more sensitive to such exposures than adults, and thus far more likely to suffer occupational diseases as a result.[48]

50. An estimated 73 million children work in mines, agricultural fields and factories, where most are likely to be exposed to various toxic substances.[49] About 60 per cent of child labourers work in agriculture, including where pesticides are used.[50] Children are also known to work with mercury in artisanal and small-scale gold mines in up to 70 countries globally, with some developing symptoms consistent with mercury poisoning.[51] Hazardous exposure of children is present at various stages of a consumer product's lifecycle. In electronics, tens of thousands of children mine a toxic ingredient of batteries (cobalt) at the front end of the lifecycle[52] and also work at the tail end, where they are exposed to various toxic substances by recovering electronic waste.

4. Migrant and temporary workers

51. Migrant workers experience a substantial risk of occupational safety and health hazards for a number of reasons, including lack of training, language barriers, discrimination and restrictions on changing employers.[53] Many migrant workers have jobs that are dirty, dangerous and demanding, and consequently face high risks of work-related accidents and disease. Irregular or undocumented migrant workers are at extreme risk of exploitation by employers who seek to reap the benefits of unfair competition. Clandestine movements, trafficking in persons and modern slavery can coincide with the exposure of migrant workers to toxic substances.

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[46] Concetta Lenga, "Occupational exposure and risk of breast cancer", Biomedical Reports, 21 January 2016.

[47] R.H. Gray and others, *Final Report: The Johns Hopkins University Retrospective and Prospective Studies of Reproductive Health Among IBM Employees in Semiconductor Manufacturing* (Baltimore, Johns Hopkins University, 1993).

[48] ILO, *Towards the Urgent Elimination of Hazardous Child Labour* (Geneva, 2018), p. 36.

[49] Ibid., p. vi.

[50] ILO, "Hazardous work of children and regulation of hazardous chemicals", 2011.

[51] Human Rights Watch, "Danger, keep out! Children's exposure to toxic substances", 28 April 2016.

[52] Amnesty International, *"This is what we die for": Human Rights Abuses in the Democratic Republic of the Congo Power the Global Trade in Cobalt*, 2016.

[53] Kawon Lee, Connor McGuiness and Tsuyoshi Karaskami, *Research on Occupational Safety and Health for Migrant Workers in Five Asia and the Pacific Countries: Australia, Republic of Korea, Malaysia, Singapore and Thailand* (Bangkok, ILO, 2011), p. 20.

52. Temporary, including seasonal, workers often do not enjoy the same safety and health protection as that accorded to permanent or resident workers. Temporary workers are at greatly increased risk of occupational injury and illness. They may begin work at a new workplace many times a year and as new workers have generally less information about the hazards they face. Employers often have less commitment to providing education or making investments to protect temporary workers.[54] Government guidance and inspection on safety and health may be limited.

5. Workers with disabilities

53. A worker with a disability may face additional risks or may be more susceptible to the consequences of exposure to toxic substances. Workers with disabilities tend to be employed in low-skilled jobs, on non-standard contracts such as part-time work or on temporary contracts.

6. Older workers

54. Older persons also face exposure to toxic substances at work. In general, ageing is associated with a decline in cognitive functions, health and recuperative ability, including decreased aerobic capacity, lower heat tolerance, reduced muscular strength and a decline in visual and hearing acuity. Any risks to which ageing workers are exposed because of their occupation will be superimposed on their existing health problems or will amplify the natural deterioration of their sensory and physical capacities. Regrettably, impacts of occupational exposure on the health of older workers are often attributed entirely to ageing, not to the exposure itself.

E. Informal economy

55. National policies and programmes to promote safe and healthy working conditions should aim not only at the formal but also at the informal economy. In many developing countries, the number of those formally employed is small compared to those who work in the informal sector. Those working in the informal sector are usually not captured in statistics regarding the impacts of hazardous substances on workers.[55]

F. Deliberate efforts to delay or obstruct protection from exposure to toxic substances

56. For economic gain, business enterprises have sought to delay the adoption of protective laws and regulations through targeted campaigns to distort science[56] and to exploit the financial insecurity of workers through the threat of job losses. These campaigns have in essence sought to undermine the rights of workers by threatening job losses and competitive disadvantages that exploit and capitalize on the economic fear of workers. Workers continue to fear pay cuts or termination if they refuse or remove themselves from work that exposes them to toxic substances.

57. Furthermore, business enterprises continue to distort evidence of intrinsic hazards, harmful exposure and other risk factors for various types of toxic chemicals (e.g. carcinogens). Business enterprises and their agents have engaged in targeted marketing campaigns to manufacture doubt and uncertainty regarding results of scientific studies that illustrate the risks and impacts upon the health of workers.

58. Efforts by business enterprises to hinder adoption of health-protective laws, exposure standards and improved practices illustrate the contempt of certain business

[54] United States Department of Labor, *Adding Inequality to Injury: The Costs of Failing to Protect Workers on the Job* (2015).

[55] Hämäläinen, p. 7.

[56] David Michaels, ed., *Doubt Is Their Product: How Industry's Assault on Science Threatens Your Health* (Oxford, Oxford University Press, 2008).

enterprises for their responsibility to prevent workers' exposure to toxics. It goes beyond disrespect, seeking to perpetuate the exploitation of inequalities within and between societies.

G. Opaque supply chains and transfer of hazardous work

59. While recognizing the societal benefits that can accompany the international transfer of beneficial technologies, the transfer of toxic work from countries with more advanced systems to countries with lower standards of worker protection continues to be a major problem. For example, chemical-intensive manufacturing and processing activities once largely located in the highly industrialized countries are now steadily expanding into developing countries and countries with economies in transition through the globalization of supply chains.[57]

60. The international transfer of dangerous and dirty work, whether extraction of natural resources, use of toxic chemicals and pesticides or disposal of hazardous wastes without appropriate measures to protect workers against exposures to toxic substances, has left workers and their communities at considerable risk of grave impacts on their human rights.[58] The lack of transparency throughout supply chains adds fuel to the problem and obstructs efforts by various stakeholders to improve occupational health.

H. Disconnected efforts on occupational and environmental health

61 A toxic workplace generally leads to a toxic environment. For example, air pollutants affect the health of workers directly exposed but also the health of their children and broader communities. Workers engaged in highly toxic livelihoods such as artisanal mining, waste disposal and a range of manufacturing (such as textiles) and agricultural activities often work very close to their homes and communities, sometimes accompanied or helped by their children. However, potential synergies that could result from stronger linkages between labour and environmental health are frequently unrealized.

I. Failures to realize the right to information

62. Information gaps create a fundamental impediment to respecting, protecting and fulfilling several human rights that are otherwise abused or violated by the exposure of workers to toxic chemicals (see A/HRC/30/40, paras. 22 and 24–25).[59]

63. At the most fundamental level, comprehensive information regarding the intrinsic health hazards of the vast majority of industrial chemicals continues to be absent, including their ability to cause cancer, to be mutagenic or to be toxic for reproduction (A/HRC/30/40). Further, the form and content of information communicated to workers regarding health risks remain a considerable challenge. The absence of or inappropriately communicated information is tantamount to deception and deception of workers is a category of exploitation, which can constitute forced or compulsory labour.[60]

64. Although risk assessments have helped to identify and restrict the use of substances that pose risks to workers, there are limitations, including the difficulty of predicting workers' exposure levels; the fact that the health hazards are known for a minority of substances and the lack of information about the hazards of tens of thousands of substances; and that little is known about the impacts of exposures to combined hazardous substances,

[57] United Nations Environment Programme, *Global Chemicals Outlook: Towards Sound Management of Chemicals* (2013).

[58] Ibid.

[59] See also Human Rights Committee, general comment No. 34 (2011) on the freedoms of opinion and expression, para. 18.

[60] See, for example, the Modern Slavery Act 2015 of the United Kingdom of Great Britain and Northern Ireland.

intermediate substances in production processes and the products of the decay of substances over time under different conditions.

65. A persistent challenge to realizing the right to information in the context of toxic chemicals are claims of confidentiality or secrecy. Illegitimate claims of confidential business information or trade secrecy regarding toxic substances and possible exposures can deprive workers of their human rights, including to safe and healthy working conditions and access to remedies. Illegitimate claims of confidentiality and secrecy involving health and safety information can mask problems and thereby stifle innovative research on products and processes to improve occupational health, while promoting a sense of impunity that can become contagious among business enterprises that continue to exploit and abuse workers by exposing them to toxic substances, and justify deriving benefits from doing so.

66. It is of great importance that health-related information be collected, processed and used in a well-controlled system that protects the privacy of workers and ensures that health surveillance is not utilized for discriminatory purposes or used in any other manner prejudicial to their interests.[61] But it is of equal importance that workers have access to their own medical records.

J. Limited implementation of International Labour Organization instruments

67. Concerns exist that relevant ILO standards for the protection of the human rights of workers are not adequately implemented and others are outdated. An independent assessment commissioned by ILO of its own organizational challenges attributed this to, inter alia, limited or non-existent collaboration of units and limited financial resources devoted to occupational safety and health-related activities.[62]

68. The low levels of ratifications of ILO instruments on occupational safety and health may be another factor, although they may in some cases be useful models for national standards. Yet another may be the regrettable exclusion of the right to safe and healthy work as a "fundamental right at work" by the ILO Governing Body.

K. Restrained freedom of association

69. Challenges persist in realizing what ILO does consider to be fundamental rights at work, namely the rights to freedom of association, to organize and to collective bargaining. Certain categories of workers are denied the right of association in some countries.[63] Workers' and employers' organizations are illegally suspended or interfered with, and in some extreme cases trade unionists are arrested or killed (A/71/385).[64] The inability to exercise these rights, together with restraints on freedom of expression, hinder the ability of workers to defend their rights from abuses linked to toxic exposures, individually and collectively.

L. Inaccessible remedies, justice and accountability

70. Studies suggest that only the smallest fraction of workers harmed by exposure to hazardous substances are able to access remedies.[65] Major obstacles to accountability

[61] ILO, *Technical and Ethical Guidelines for Workers' Health Surveillance*, Occupational Safety and Health Series No. 72 (Geneva, 1998).

[62] ILO, *Independent Evaluation of the ILO's Strategy on Occupational Safety and Health Conditions at Work* (2013), pp. 46–47.

[63] See ILO, International Labour Standards on Freedom of Association.

[64] Ibid.

[65] Andrew Watterson and Rory O'Neill, "Double trouble on relative risk for occupational diseases", *Hazards Magazine*, March 2015.

include the unreasonably high burden of proof, the long latency periods for consequences to manifest in some cases and the difficulty in establishing causation; substantial information gaps with respect to the identification of hazards, measurement of exposure and specification of the epidemiological impacts; possible exposure to a multitude of different substances in various occupational settings and over a working lifetime; and the provisions of contractual relationships between suppliers and purchasers which can shift responsibility up or down a supply chain.

71. The types of information required and the responsibility for proving the cause of harms suffered are often common denominators in cases where workers struggle to access effective remedies. Workers often lack the necessary knowledge and resources to enable them to establish the necessary elements for accessing remedies. First, it is not uncommon for them not to know to which substances they were exposed. Second, substances to which they were exposed may not have been studied for their ability to cause disease or disability in humans; adequate information, and even a minimal amount of health and safety data, is lacking for tens of thousands of potentially hazardous industrial chemicals. Third, when allegations of exposure to hazardous substances are made, "objective evidence of the extent of, or even the existence of, exposure, is almost never available",[66] although it should be the responsibility of the employer to track and maintain such data, and the failure to do so is used to justify the unacceptable denial of remedies to sick and impaired workers. Finally, workers often move between employers and industries, which can subject them to diverse hazardous exposures. The personal behaviour of workers, such as tobacco or alcohol use, may be invoked to further complicate the determination of causation.

IV. Conclusions and recommendations

72. **The exposure of workers to toxic substances can and should be considered a form of exploitation and is a global challenge, with countries of all levels of development playing a role in the problem. States, business actors and international organizations can eliminate or minimize exposures and must do so with urgency.**

73. **The Special Rapporteur offers 15 principles to help States, business enterprises and other stakeholders protect, respect and fulfil the human rights of workers that have been infringed by their occupational exposures to toxic and otherwise hazardous substances. They are grounded in international human rights law and build upon the Guiding Principles on Business and Human Rights, ILO instruments and international agreements on toxic chemicals and wastes, among others.[67] These principles are the outgrowth of cases brought to the attention of the mandate since its inception in 1995.**

74. **In his view, if implemented, these principles will help strengthen the coherence between human rights and occupational health and safety standards regarding the exposure of workers to toxic substances. They are not intended to be definitive, but mark the beginning of a process to clarify the duties and responsibilities of all parties.**

75. **In the coming months, the Special Rapporteur will gather input from States and other stakeholders regarding how these principles are reflected in their laws, policies and procedures, as relevant, on occupational exposure. He plans to present a more elaborated set of principles to the Human Rights Council at a future session of that will provide a framework for implementation by States, business enterprises and other actors. The Special Rapporteur encourages ILO and WHO to continue their efforts and for ILO in particular to seek to reflect these principles in its efforts to review and revise its conventions and standards on occupational safety and health.**

[66] McElveen, "Establishing proof of exposure".

[67] For example, recommendations adopted by the International Conference on Chemicals Management (SAICM/ICCM.3/15) and recommendations of an international workshop on hazardous substances in the lifecycle of electrical and electronic products held in Vienna in 2011 (SAICM/OEWG.1/11).

A. Principles on duties and responsibilities to prevent exposure

76. States have a duty and business enterprises a responsibility to respect, protect and fulfil the rights of workers; consumers, the military, investors and others also have responsibilities that must be considered.

Principle 1 — States have a duty to protect the human rights of all workers through the prevention of exposure to toxic substances.

77. States must do everything in their power to protect all workers from occupational exposures to toxic substances in their territory and/or jurisdiction. This duty exists regardless of whether the employer is a business enterprise or the State. This requires taking appropriate steps to prevent, investigate, punish and provide redress for cases of occupational exposures to toxic and otherwise hazardous substances through effective policies, legislation, regulation and enforcement, as well as adjudication.[68]

78. Human rights are universal. Everyone has the same right to safe and healthy work, regardless of income, age, gender, ethnicity, race, religion or other class or status. States have heightened duties regarding the protection of workers at elevated social or physiological risks, including informal workers in global supply chains. Migrants, minorities and persons with disabilities have the right to equal standards of protection. Children and pregnant women should never use or otherwise be exposed to toxic substances at work. Special measures must be taken for the protection of workers in high-risk sectors such as mining, agriculture, construction, energy, the military, manufacturing and waste disposal, among others, from exposure to toxic substances.

Principle 2 — Business enterprises have a responsibility to prevent occupational exposures to toxic substances.

79. Business enterprises have a responsibility, as part of the due diligence expected of them, to "prevent [and] mitigate" impacts on human rights, including workers' rights, due to exposures to toxic substances.[69] These enterprises include employers, purchasers of products and suppliers of toxic substances, among others. In the case of occupational exposures, the "impacts" that business enterprises are responsible for include exposure to toxic substances and adverse health impacts. This responsibility calls for the continuous improvement of working conditions and extends to human rights impacts to which they are linked through their business relationships and supply chains, both at home and abroad, and throughout their products' lifecycles.[70]

80. Prevention of human rights abuse is principal and a prelude to mitigation in due diligence procedures.[71] To prevent impacts on workers' rights, business enterprises have a responsibility, first and foremost, to prevent exposure through the elimination of toxic substances from their products and production processes to the maximum extent possible. If hazards cannot be eliminated, business enterprises should rigorously and systematically apply the hierarchy of hazard controls to prevent exposure, with personal protective equipment the last resort. To the extent that exposure cannot be avoided after applying the hierarchy, business enterprises must mitigate the impacts of exposure on health.

Principle 3 — Hazard elimination is paramount in preventing occupational exposures.

81. States should include the hierarchy of hazard controls in legislation to prevent to the extent possible exposure of workers to toxic substances. States should ensure

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[68] Guiding Principles on Business and Human Rights, principles 1, 4 and 15.

[69] Ibid., principle 15.

[70] See, for example, Global Sustainability Standards Board, Global Reporting Initiative, *GRI 403: Occupational Health and Safety 2018*.

[71] Guiding Principles on Business and Human Rights.

that these laws and policies are precautionary in practice because of the high level of scientific uncertainty that often prevails. As part of their occupational safety and health legislation, States should compel business enterprises to eliminate hazards wherever possible and apply the hierarchy where the hazard cannot be eliminated.

Principle 4 — Workers have the right not to be exposed to toxic substances without their prior informed consent.

82. **The right to safe and healthy work encompasses the right of workers not to be exposed to toxic substances without their prior informed consent. Workers have the right to remove themselves from situations where they are exposed to toxic chemicals and other hazardous substances that they have a reasonable justification to believe present a danger.**

83. **States should respect, protect and fulfil the right of workers not to be exposed without their prior informed consent. States should clearly reflect this right in their laws, investigating and punishing any alleged violations as warranted and ratifying ILO conventions. States should include the failure of business enterprises to abide by the above principle in their definitions of forced labour, modern slavery and/or exploitation.**

84. **Employers have a responsibility to fully inform and obtain the consent of workers prior to exposing them to toxic substances. Employers should respect this principle and right irrespective of the State's willingness to enact necessary laws. Employers should be able to demonstrate that they have informed all employees, subcontractors and suppliers of this right and that mechanisms or procedures to remove themselves from unsafe or unhealthy conditions of work are in place. The absence of such mechanisms or procedures should not present an obstacle to the exercise of this right.**

Principle 5 — Duties and responsibilities to prevent the exposure of workers to toxic substances extend beyond borders.

85. **The transboundary transfer of hazardous work to countries with lower levels of protection should be considered a form of exploitation if reasonable measures are not taken to protect workers.**

86. **States are obliged to take reasonable measures to prevent workers' exposure to toxic substances that occur outside their territories and that give rise to infringements of applicable rights due to the activities of business entities over which they can exercise control and that are reasonably foreseeable.[72] States should require such business entities to act with due diligence to identify and prevent abuses by foreign subsidiaries, suppliers and other business partners.**

87. **Business enterprises are responsible for the consequences of exposures of workers to hazardous substances that they cause, contribute to or to which they are linked.[73] Businesses have responsibilities throughout the lifecycle of their products, from extraction to final disposal, up and down their supply chains. They have a responsibility to ensure that they and their suppliers, both at home and abroad, adopt good practices such as the hierarchy of hazard controls to prevent exposure to toxic substances through their products' lifecycles, their operations and their services.**

Principle 6 — States must prevent third parties from distorting scientific evidence or manipulating processes to perpetuate exposure.

88. **States must prevent, through legislation or other measures, the deliberate distortion of scientific evidence or manipulation of processes by business enterprises**

[72] Committee on Economic, Social and Cultural Rights, general comment No. 24 (2017) on State obligations under the International Covenant on Economic, Social and Cultural Rights in the context of business activities, paras. 30–32.

[73] Guiding Principles on Business and Human Rights, principle 13.

and other third parties to the detriment of workers' health and safety. The protection of public health is a legitimate exception to freedom of expression. Criminal sanctions should be available for such misconduct by business enterprises and other actors.

Principle 7 — Protecting workers from exposure to toxic substances protects their families, their communities and the environment.

89. Protecting workers from toxic exposures has broader benefits for society. States should recognize the mutually reinforcing nature of protecting workers from occupational exposures to toxic substances and the protection of the environment. Laws and policies to protect human health from hazardous substances should take into account both occupational and environmental exposures, among other factors. States should ensure effective cooperation between authorities with responsibility for labour, public health and the environment.

B. Principles regarding information, participation and assembly

90. The rights to information, participation and freedom of expression and association, as well as the rights to unionize and collective bargaining, enable the prevention of violations and abuses of human rights arising from toxic exposures of workers. Furthermore, the full realization of the right to information is necessary to realize the right of workers to an effective remedy for the adverse impacts of such exposures.

Principle 8 — Every worker has the right to know, including to know their rights.

91. Every worker has the right to know current information about their actual and potential exposures to toxic and otherwise hazardous substances. Occupational health and safety information must be available and accessible to workers in a form that effectively serves their needs, bearing in mind their skills and circumstances, and communicated through training and other means (A/HRC/30/40). States, employers and business enterprises must efficiently communicate health and safety information, including the results of medical examinations, to workers, trade unions and other workers' representatives.

92. States are duty-bound to generate, collect, assess and update information on hazards and risks encountered by workers, as well as epidemiological evidence of occupational diseases and disabilities (ibid.).

93. Business enterprises are responsible for identifying and assessing the actual and potential exposure by workers to hazardous substances in their supply chains and resulting from their own activities (ibid.). This includes information on the types of hazardous substances in occupational settings, the intrinsic hazards of such substances and exposure-related data. Chemical suppliers have heightened responsibilities to identify and assess and to communicate information for the protection of workers to workers, employers, other business enterprises and States.[74]

94. As well as the right to information about occupational health risks, workers also have the right to be informed of all their rights and the relevant duties and responsibilities of States and business enterprises regarding these rights, and how they can exercise and defend their rights when they are abused or violated.

Principle 9 — Health and safety information about toxic substances must never be confidential.

95. States have a duty to ensure that claims that information about toxic substances are confidential business information or trade secrets are legitimate (ibid.). While confidentiality of personal medical histories must be ensured, they must not be used to

[74] ILO Chemicals Convention.

obscure health problems arising in the workplace. States should ensure that criminal sanctions are applicable to businesses and other actors that fail to disclose health and safety information. Employers and suppliers of chemical substances should clearly state in their policies that they will not keep such information secret.

Principle 10 — The right to safe and healthy work is inseparable from freedom of association, the right to organize and the right to collective bargaining.

96. **Freedom of association and the effective recognition of the right to collective bargaining are fundamental labour rights, applying to all people in all States regardless of the level of economic development.[75] Without freedom of association, including to form unions, and the right to collective bargaining workers stand little chance of defending their right to safe and healthy work and other human rights. For human rights obligations to be met and the objective of sustainable development achieved, rights holders must be involved and participation by workers throughout the system should be upheld.[76]**

97. **States are obliged to protect, promote, respect and fulfil the rights to freedom of association, to organize and to collective bargaining through effective legislation, regulation and policies. They must ensure that everyone can exercise the right to freedom of association in the workplace without discrimination.[77]**

98. **Businesses should meet their obligations to respect the rights of workers to freedom of association, to organize and to collective bargaining. States should fulfil their role in preventing or halting violations of these rights by businesses and other parties.**

Principle 11 — Workers, representatives of workers, whistle-blowers and rights defenders must all be protected from reprisal and the threat of reprisal.

99. **Empowering rights holders, particularly those most at risk, to defend their rights helps States meet their obligations under human rights law and upholds the principle of accountability and the rights to information and an effective remedy, among others.**

100. **For workers to enjoy their right to safe and healthy work, workers or their representatives must be able to raise their concerns with employers, their co-workers and government agencies without fear of retaliation. Workers, whistle-blowers and human rights defenders must be free from intimidation, threats and other reprisals for exercising their rights and defending the rights of those who are, or may be, victims of occupational exposures to toxic and otherwise hazardous substances.**

101. **The threat of loss of employment or income should never be used to gain an advantage when trying to reach an agreement on protecting the rights of workers to safe and healthy work. This includes threats by employers to move jobs abroad.**

102. **States should have in place national protection programmes for defenders of labour rights and initiate appropriate disciplinary, civil and criminal proceedings against perpetrators of reprisals, intimidation or threats of reprisals against defenders. States should commission independent periodic reviews of national protection programmes to enhance effectiveness in protecting defenders of labour rights, in consultation with workers, whistle-blowers and defenders, as well as trade unions and civil society organizations that represent them.**

[75] ILO Declaration on Fundamental Principles and Rights at Work (1998).

[76] ILO Safety and Health Convention.

[77] For example, on the grounds of type of work or employment, nature of the workplace, enterprise or sector, or immigration or other status.

C. Principles regarding effective remedies

103. Ensuring access to justice and effective remedies can motivate business enterprises to develop and adopt safer practices that engage their responsibility, ranging from substituting less hazardous alternatives to adopting engineering controls to reduce exposure. On the other hand, the impunity of certain business enterprises and other beneficiaries whose acts or omissions lead to the exposure of workers to toxic substances is an impediment to improving the situation of countless workers around the world. The pervasive inaccessibility of effective remedies to workers who are victims of toxic exposures serves as a barrier to the transition to safer, healthier work for millions of workers around the world.

Principle 12 — Governments should criminalize allowing workers to be exposed to substances that are known or should be known to be hazardous.

104. Criminal sanctions should be available to help ensure accountability for human rights obligations and to fight impunity.

105. States should ensure that national legislation provides for criminal liability of employers and other responsible individuals and entities for exposing workers to substances that are or should be known to be hazardous. States should investigate and prosecute such cases, ensuring that heads of business enterprises bear responsibility along with other actors knowingly or negligently involved.

Principle 13 — Workers, their families and their communities must have immediate access to an appropriate and effective remedy, which should be available from the time of exposure.

106. Workers exposed to toxics are harmed and their rights are abused or violated at the time of exposure, not only when a disease or disability manifests itself in a worker or in a worker's child. The latency of diseases and disabilities after exposure, which can be years or even decades, can make access to an effective remedy impossible for many workers and their families.

107. An appropriate and effective remedy includes prompt reparation for harms suffered, health care, compensation, guarantees of non-repetition and adequate training for rehabilitation, reinsertion and reasonable accommodation.[78] An effective remedy also includes bringing to justice those responsible for exposure to toxic substances.

108. States have the primary duty to realize the worker's right to an appropriate and effective remedy, including under their laws. States have an obligation to automatically investigate the possible existence of widespread violations after a minimum threshold is reached and to engage in international cooperation in doing so. This should be separate from any investigations or actions undertaken by the victim to pursue an effective remedy. States should ensure the cessation of conditions that give rise to occupational exposures, including changes in relevant laws and practices, prohibitions on the production and use of certain classes of substances and the dissemination of information to prevent recurrence (see A/HRC/33/41, para. 40). Penalties imposed should be significant enough to induce and motivate business enterprises and other actors to take precautionary measures to prevent workers' exposure to toxic substances and to act as a deterrent to ensure non-recurrence.

109. Business enterprises that cause, contribute to or are linked to occupational exposures to toxic substances have a responsibility to establish robust processes to enable workers to have timely access to an appropriate and effective remedy.

[78] ILO, *Promoting Diversity and Inclusion Through Workplace Adjustments: A Practical Guide* (Geneva, 2016).

Principle 14 — Workers or their families should not bear the burden of proving the cause of their illness or disability to access an effective remedy.

110. **Placing the burden of proof on those harmed by toxic substances at work can be an enormous and often insurmountable challenge. States should ensure that when there is information that a worker may have been exposed to toxic substances at work and where such exposure has been demonstrated to cause harm in similar situations, the burden should shift to the employer to prove no harm.[79] This may be particularly appropriate where the facts and events relevant to resolving a claim lie wholly or in part within the exclusive control of the employer or other third party.**

111. **Information that a worker may have been exposed to toxic substances need not be in the form of exposure levels or identification of the precise chemical; it can also include information that occupational diseases are known to have occurred in a particular type of work or industry. The employer or other beneficiaries of services should be allowed to try to rebut the presumption of responsibility, but the burden should be on the employer.**

112. **A major challenge for workers in supply chains is that the business enterprise may not have sufficient resources to provide an adequate and effective remedy to harmed workers. States must ensure that beneficiaries of services are also responsible for the provision of remedies. Indeed, States have developed legislation to address circumstances where an enterprise provides or enables another to acquire benefits of any kind from worker exploitation, which can include exposure to toxic substances.[80]**

Principle 15 — States should assert jurisdiction for cross-border cases of workers harmed by occupational exposure.

113. **Victims of abuse of their rights by transnational business enterprises face specific obstacles in accessing effective remedies for occupational exposure to toxic substances. Challenges include proving damages and establishing causal links, as well as the financial costs of access to remedy in most jurisdictions and the lack of independence of certain judicial systems. States have the duty to take the necessary steps to address these challenges to prevent a denial of justice and ensure the right to effective remedy for victims of occupational exposure to toxic substances.[81]**

114. **States should ensure that their laws provide for jurisdiction over workers' exposures to toxic substances that occur abroad. Home States should assert jurisdiction for such corporate abuse, including criminal sanctions where appropriate. Effective accountability and access to remedy in transboundary cases require international cooperation, including measures for prevention and the disclosure of information.**

[79] If the employer does not exist or cannot otherwise provide an effective remedy to the worker, alternative recourse should be available.

[80] See, for example, the United Kingdom Modern Slavery Act 2015, Part 1, sect. 3 (5).

[81] Committee on Economic, Social and Cultural Rights, general comment No. 24.

Annex

Mapping references to the rights of workers in previous reports and selected communications of the Special Rapporteur

For over 20 years, the Commission on Human Rights, and subsequently the Human Rights Council, have mandated a special rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes (formerly the illicit movement and dumping of toxic and dangerous products and wastes) to monitor and report on the issues confronting workers in various industries around the world. These sectors include extractive industries, manufacturing, agriculture and food, the dismantling of end-of-life ships (shipbreaking) and the disposal of electronic waste and other forms of waste disposal, in both the formal and informal sectors. The present annex contains examples of cases brought to the attention of the mandate, selected from reports of and communications to the Special Rapporteur. It is envisaged that a more complete compilation will be submitted to the Council at future sessions.

Report	*References to occupational exposures*	*Challenges faced by workers*
"Legal framework related to the release of toxic and dangerous products during armed conflict" **(A/HRC/5/5, sect. III) (2007)**	The report contained an overview of previous reports that illustrate impacts of workers' exposure to toxic chemicals on human rights. The former Special Rapporteur's report in 2004 highlighted the adverse impacts on the human rights of workers and communities involved in hazardous waste disposal or recycling operations of obsolete ships and electronic wastes in developing countries.[1] The 2006 report of the former Special Rapporteur focused on chronic, low-level exposure to hazardous chemicals.[2] Previously the former Special Rapporteur reported on the human rights impact of hazardous chemicals from acute exposures, such as in the context of incidents of pesticide poisoning in developing countries or from catastrophes like the Bhopal disaster. In the 2007 report the former Special Rapporteur drew attention to the adverse effects of toxic and dangerous products in the context of armed conflicts, including on soldiers.	• Inadequate standards of protection • Limited progress in prevention of exposure • Disconnected efforts on occupational and environmental health • Opaque supply chains and the transfer of hazardous work • Exploitation of those most at risk

[1] E/CN.4/2004/46 and Corr.1, paras. 29–43.
[2] E/CN.4/2006/42.

Report	*References to occupational exposures*	*Challenges faced by workers*
"Mission to Ukraine" **(A/HRC/7/21/Add.2) (2008, mission carried out in 2007)**	In relation to workers, the former Special Rapporteur was informed that workers handling toxic material (acid tars) were not informed of the materials toxicity and would unload the acid tars manually. These tars observed to be in partially exposed conditions around the grounds of the Dobrotvir power station, posing threats of exposure to the workers, their families and the communities living around the area.	• Monitoring and enforcement gaps • Failures to realize the right to information
"Adverse effects on human rights and right to information and participation" **(A/HRC/7/21, sect. III) (2008)**	The former Special Rapporteur noted that, because of structural conditions in many developing countries, women and the young are particularly at risk from transfers of toxic and dangerous products and wastes. Women, children and the young are often among the poorest and therefore likely to work in polluting industries and scavenge dumps of waste for reusable materials. They are also most likely to have limited access to information on waste products and to health facilities in the event of contamination. The former Special Rapporteur called for greater global attention to the gender and age dimensions of the illicit movement and dumping of toxic and dangerous products and wastes on the enjoyment of human rights.	• Exploitation of those most at risk • Failures to realize the right to information • Opaque supply chains and the transfer of hazardous work
"Mission to the United Republic of Tanzania" **(A/HRC/9/22/Add.2) (2008)**	During a country visit to Tanzania in 2008, the former Special Rapporteur observed that workers did not use safety equipment such as gloves, dust masks, boots and glass retorts in the course of extracting and processing gold. He was particularly concerned because dangerous chemicals, mercury and cyanide, were used in the extraction process. Most of these were artisanal and small-scale miners (ASM) in the informal sector. The former Special Rapporteur was informed that there were instances of miners not receiving adequate information on the impact mercury can have on their health. In other cases, however, local miners were sensitized through efforts made by the Government, non-governmental organizations and through projects such as the Global Mercury Project, launched by UNIDO and the Ministry of Energy and Minerals with the support of other stakeholders. Some workers informed the former Special Rapporteur that they were aware of the dangers of using mercury and other chemicals in the extraction process; however, due to poverty and the lack of a suitable alternative, the miners were forced to continue to use mercury and other dangerous products without supervision, endangering the health of themselves, their children and their community more broadly. The former Special Rapporteur was concerned about the number of women and children he saw during his visits to the artisanal and small-scale mining areas. Many of the women and children were unaware of the health and safety hazards that are associated with artisanal and small-scale mining, such as mercury poisoning in the long term, amongst others. It was the case that during the processing of gold, ore is moved to the milling centres by women and children. In addition to working in harsh environments, often exposed to direct sunlight and not able to afford safety equipment, the women were sometimes subjected to threats and intimidation by other members of	• Inadequate standards of protection • Limited progress in prevention of exposure • Exploitation of those most at risk • Failures to realize the right to information • Opaque supply chains and the transfer of hazardous work • Monitoring and enforcement gaps • Informal economy

Report	*References to occupational exposures*	*Challenges faced by workers*
	the community, especially if they were migrants. The presence of child labour in mining was attributed to poverty. Children were documented working in artisanal and small-scale mines in order to help the family and supplement total household income in order to buy basic goods and food. In Tanzania, child labour in the mining sites was described as common from the age of 10. The former Special Rapporteur saw children working and playing with their bare hands with toxic mercury, a particularly dangerous state of affairs as they are vulnerable to physical and chemical hazards. Mercury can cause severe damage to the developing brain, especially for developing children. The former Special Rapporteur was particularly concerned that children as young as 10 were being exposed to such highly toxic substances. The former Special Rapporteur regretted the lack of statistics on occupational diseases related to mining. The former Special Rapporteur was informed by the authorities, non-governmental organizations and mining associations that there was no system of recording mining-related incidents, such as accidents that occur during the processing of gold amongst others. This was particularly worrying given the fact that artisanal and small-scale miners are often some of the poorest people and are therefore unlikely to have access to health-care. The former Special Rapporteur was further informed that while many miners were aware of the toxicity and dangers of mercury poisoning as well as other chemicals that may be harmful to their health, the miners and communities do not know when deaths and illnesses are related to their work, or to other illnesses.	
Communications sent to and replies received from Governments **(see A/HRC/7/21/Add.1, Germany, Malaysia) (2006)**	On 17 July 2006, the former Special Rapporteur sent an urgent appeal regarding allegations relating to the SS Blue Lady (ex-Norway) bearing tonnes of toxic wastes such as asbestos, polychlorinated biphenyls (PCBs) and other contaminants in its structure, and which was reportedly waiting to be dismantled in Alang, state of Gujarat, India. The ship was reportedly denied entry to ship breaking yards in Bangladesh in February 2006 based on its toxic waste content. It was alleged that the ship-breaking yards in Alang lacked the possibility of protection of workers from exposure to toxic chemicals and environmentally sound management of toxic wastes. According to reports from experts, as much as 1,200 tonnes of asbestos remained in the SS Blue Lady, posing grave risks to workers and the community. The former Special Rapporteur expressed concerned with the potential human rights violations that could occur if the allegations mentioned in this communication were correct and the dismantling of the ship did indeed take place.	• Monitoring and enforcement gaps • Exploitation of those most at risk • Informal economy • Opaque supply chains and the transfer of hazardous work • Failures to realize the right to information
"Shipbreaking" **(A/HRC/12/26) (2009)**	Shipbreaking represents an important source of raw material supply and provides jobs to tens of thousands of persons. Over 95 per cent of a ship can be recycled. In principle the recycling of end-of-life vessels constitutes the best option for ships that have reached the end of their operating life, and proper facilities are available to recycle ships. However, the abhorrent working	• Inadequate standards of protection • Monitoring and

Report	References to occupational exposures	Challenges faced by workers
	conditions and abysmal environmental protections prevailing at many shipbreaking yards in the world, and in particular in South Asian countries where ships are dismantled directly on tidal beaches, are noted to risk adversely affecting the enjoyment of several human rights, including the right to life, the right to the highest attainable standard of physical and mental health, and the right to safe and healthy working conditions, among others. The report notes with concern the ongoing use of these substandard shipping yards, and their unsustainable "beaching" practice, by major shipping companies around the world despite the availability of safer methods and the prohibition on such substandard practices in their home states. In shipbreaking yards, workers often are exposed to toxic chemicals including asbestos dusts and fibres, highly toxic industrial chemicals which have been banned for decades but are still present in ships, as well as lead, mercury, arsenic or cadmium in paints, coatings and electrical equipment. Workers are often without protective equipment to reduce exposure. Prolonged exposure to these chemicals increases the risk of developing slow-progressing but fatal diseases, which may not become apparent until many years after exposure. Shipbreaking activities expose workers to a wide range of workplace activities or conditions which may cause death, permanent or temporary disabilities, injuries, ill-health and occupational diseases. Long-term exposure to hazardous substances and wastes protection may also lead to serious or irreversible work-related diseases, including lung diseases, several forms of cancer and asbestos-related illnesses. Most workers are illiterate, very poor and are not aware of the health and safety risks associated with long-term exposure to these substances. Persons living in residential areas close to the yards also risk developing diseases related to the exposure to toxic and dangerous substances produced during shipbreaking activities. Furthermore, a great number of workers die or are seriously injured because of work-related accidents or occupational diseases related to long-term exposure to hazardous materials present on end-of-life ships. Workers do not usually receive any information or safety training. They live in makeshift facilities which often lack basic minimum requirements such as sanitation, electricity and even safe drinking water, compounding health risks of toxic exposures at work. There is a general lack of medical facilities and social protection, and injured workers or their relatives hardly receive any compensation for work-related accidents resulting in fatal injuries or permanent disabilities. In spite of an increased international awareness on the issue in past years, shipbreaking continues to be one of the most hazardous occupations in the world due to the extremely poor working practices and environmental conditions prevailing in many shipbreaking yards. Health and safety legislation is often not applicable to shipbreaking activities, due to the fact that it is not recognized as an industry in some countries, and this leaves workers in shipbreaking yards in a particularly vulnerable situation. Furthermore, when national labour standards are applicable, they are rarely enforced due to corruption of law enforcement officials and the lack	enforcement gaps • Opaque supply chains and the transfer of hazardous work • Inaccessible remedies, justice and accountability • Disconnected efforts on occupational and environmental health • Failures to realize the right to information • Limited progress in prevention of exposure • Exploitation of those most at risk • Restrained freedom of association • Deliberate efforts to delay or obstruct protection from toxic exposure • Informal economy

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of effective inspection mechanisms. In many shipbreaking yards, workers are not provided with personal protective equipment (PPE), such as skin, eye or lung protection, aimed at ensuring the safe handling of hazardous materials or preventing the inhalation of toxic substances. Appropriate PPE for working in specialized areas, such as respiratory protective equipment for work in conditions where there is a risk of oxygen deficiency, is also generally not available. There is usually no equipment for machine safety, fire safety, chemical safety and water safety, and when such equipment exists, it is poorly maintained. With a few exceptions, the vast majority of workers do not receive any information on the hazards or risks to health and safety, nor do they receive any training on how to minimize risks to health and safety at work.

Due to the informal nature of working arrangements, workers are not covered by social protection schemes, and do not receive any benefit in case of injury, sickness, temporary or permanent disability in the case of occupational accidents or diseases. Injured workers or relatives of deceased workers receive hardly any compensation for work-related accidents resulting in fatal injuries or permanent disabilities. When compensation is paid, the amount received is generally much lower than the amount stipulated by the law. In case of accidents, employers usually pay for first treatment and immediate medical expenses, but not for long-term medical treatment or for expenses linked to chronic work-related diseases. If a worker is affected by an occupational disease, he is often unable to retain or find further employment opportunities in any of the yards.

There is no written contract of employment for semi-skilled and unskilled workers. They can be fired at any time with no prior notice, and without the need to indicate any reasonable ground. The absence of job security, due to the lack of formal work contracts, and the climate of intimidation prevailing in the yards de facto prevent workers in shipbreaking yards from exercising their right to form trade unions for the promotion and protection of their economic and social interests and their right to collective bargaining.

Semi-skilled and unskilled workers usually live in makeshift facilities built by yard owners on, or just outside, the yards. The shacks are often congested, and lack basic sanitation facilities, electricity and even drinking water. Workers are too often not provided with proper cooking or eating facilities in the yards, and are compelled to go to nearby shops and tea stalls for their food. Due to their proximity to the yard, workers continue to be exposed to toxic and dangerous substances like asbestos and hazardous fumes at their sleeping quarters.

There are no comprehensive statistical data on persons who died or developed disabilities as a result of occupational accidents in the shipbreaking industry. The authorities rarely keep records on accidents occurring at shipbreaking facilities. In Bangladesh, for example, neither the yard owners nor public authorities appear to collect statistical data about deaths and disabilities caused by accidents at shipbreaking yards. According to media reports, more than 400 workers were killed and 6,000 seriously injured between 1985 and 2005 in Bangladesh, but NGOs estimate that at least 1,000 people have died in Chittagong due to accidents over the last decades. When official figures exist, they appear to be largely underestimated. According to official figures, for example, there were 434 incidents at the Alang yards between 1996 and 2003, killing 209 workers;

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	however, NGOs feared that that the number of workers who died or developed disabilities as a result of work accidents may be much higher. Through the adoption of various unfair practices, employers often conceal information about work-related accidents. Many major cases are not reported and settlements are reached with the workers secretly. In case of fatal accidents, families of the victims are usually not informed, as contractors do not use proper names or addresses of the workers and there is no monitoring or inspection of the yards. Official and estimated figures do not include workers who died of occupational diseases related to long-term exposure to toxic and hazardous wastes and materials: the "hidden" deaths. It is virtually impossible to get any data about the number of affected workers, since the symptoms of many of these occupational diseases only appear several years after exposure, but it is estimated that a significant number of individuals died, and many others will die in the future, because of occupational diseases related to shipbreaking activities. For example, a medical study submitted to the Indian Supreme Court in September 2006 concluded that 16 per cent of the workforce handling asbestos in Alang showed symptoms of asbestosis, and was therefore at serious risk of developing mesothelioma in the future. In relation to workers' rights, the former Special Rapporteur encouraged States to take steps to improve their regulatory and enforcement capacities in the field of labour law and worker safety, health and welfare, so as to strengthen the protection afforded to persons employed in the shipbreaking industry. States were also encouraged to eliminate obstacles which de facto prevent workers in shipbreaking yards from exercising their freedom of association and right to collective bargaining, and set up an effective and reliable system of labour inspections, with the participation of workers' representatives. Shipbreaking States should also take immediate steps, to the maximum of their available resources, with a view to realizing fully the right of workers to social security in the event of accidents and occupational diseases. Yard owners should take all appropriate measures, when needed through State support and international assistance and cooperation, to improve health and safety at work (inter alia by providing adequate personal protective equipment and safety training), promote better health care, housing and sanitation facilities for workers, and develop appropriate mandatory insurance schemes to protect workers in the event of accidents and occupational diseases. In relation to data collection, the former Special Rapporteur urged ship-recycling States and yard owners to collect disaggregated statistical data on an annual comparative basis on workers who die or develop disabilities as a result of work-related accidents or occupational diseases, and make these data publicly available.	
"Review of the Work and Activities" **(A/HRC/15/22) (2010)**	The former Special Rapporteur reminded the Council of the extremely poor working practices and environmental conditions prevailing in most shipbreaking yards would continue to require the attention of the mandate holder. The former Special Rapporteur was of the view that the Convention alone is not sufficient to bring about significant improvements in the working practices prevailing in shipbreaking yards or in the elimination of the serious environmental	• Inadequate standards of protection • Monitoring and

Report	*References to occupational exposures*	*Challenges faced by workers*
	pollution that the yards generate.	enforcement gaps
	Electronic and electrical appliances contain hundreds of different substances, many of which are highly toxic and pose significant risks to human health and the environment if they are not managed and disposed of in an environmentally sound manner. In developing countries, the vast majority of obsolete electrical and electronic equipment is dismantled in small-scale, informal workshops that separate their various components (i.e. plastic, ferrous metals, non-ferrous metals, glass) for recycling or reuse. During the process of breaking down old computers and other high-tech devices, workers are exposed to hazardous substances, including toxic heavy metals such as lead, cadmium, beryllium and mercury, hazardous chemicals, such as brominated flame retardants, and other toxic plastic additives. Furthermore, unusable parts are usually disposed of in landfills or burned, causing widespread and long-lasting contamination of soil, air and surface and groundwater resources.	• Exploitation of those most at risk • Informal economy • Opaque supply chains and the transfer of hazardous work
	The report notes with concern the problems posed by pesticides in developing countries, due to the large number of persons employed in the agricultural sector, weak or non-existent regulatory regimes and little public awareness of the potential health and environmental harm caused by pesticide exposure. It is reported that as many as 25 million agricultural workers suffer serious or irreversible work-related diseases, including several forms of cancer, endocrine system disruption and reproductive and neurological disorders, linked to long-term exposure to hazardous pesticides.	
	Lead in paint was noted as a major source of lead exposure of workers and others. Inhalation of lead-contaminated house dust is the most common exposure pathway to lead-based paint for children and adults alike. However, residential renovation and paint removal can be significant sources of lead exposure for construction workers as well as residents. Dry sanding, abrasive blasting, and burning, welding, or heating surfaces covered with lead paint typically generate highly dangerous airborne lead levels.	
"Mission to Kyrgyzstan" **(A/HRC/15/22/Add.2) (2010)**	High unemployment rates, decreases in living standards and lack of social protection force a large number of individuals to leave their villages to search for employment opportunities and a better standard of living abroad. About 400,000 citizens leave the country every year. Most choose to migrate, both legally and illegally, to Kazakhstan and the Russian Federation, where they are at risk of occupations.	• Exploitation of those most at risk • Inadequate standards of protection
	Risks to agricultural workers from obsolete, prohibited or poor quality pesticides, such as DDT manufactured in China, were noted with concern. Such highly hazardous pesticides reportedly continued to be illegally imported into, and exported out of, the country due to the lack of adequate controls at the borders with China and Tajikistan. Such highly hazardous pesticides were noted as being frequently unlabelled, or are labelled with information that farmers or agricultural workers cannot read either because they are not in the worker's local language or because of insufficient literacy.	• Monitoring and enforcement gaps • Failures to realize the right to information
	Studies showed accumulation of highly toxic mercury in various tissues and parts of the body	

Report	*References to occupational exposures*	*Challenges faced by workers*
	(hair, blood, urine) of workers and other persons analysed. Maximum levels were registered among workers employed in the mercury plant. High concentrations of mercury were also observed in children's blood and in the milk of nursing mothers. Although no comprehensive study was then carried out to assess the extent of mercury contamination, elevated mercury concentration, often exceeding maximum allowable concentration norms, have been recorded in air and water resources in areas surrounding large enterprises that are currently producing or had produced mercury in the Batken and Osh oblasts. Information on chemical products sold in the country should be available, accessible, user-friendly, adequate and appropriate to the needs of all stakeholders. People handling hazardous chemicals, such as farmers and employees in the chemical or energy sector, should receive appropriate information and training on such chemicals and their intrinsic properties, and on how to use them in ways that minimize adverse health consequences.	
"Mission to India" **(A/HRC/15/22/Add.3) (2010)**	The purpose of the visit was to examine the progress made, and the difficulties encountered, by the country in implementing its obligations under human rights and environmental law to ensure the sound management and disposal of hazardous products and wastes. In particular, the aim of the mission was to gather first-hand information on the adverse effects that hazardous activities, such as shipbreaking and the recycling of electrical and electronic waste (e-waste), have on the enjoyment of human rights of the countless individuals working in these sectors or living close to the places where these activities take place. Despite some progress noted, the former Special Rapporteur identified a number of key challenges. National legislation on waste management and health and safety at work was not effectively implemented, and the current institutional framework appeared inadequate to respond to the challenges posed to worker and others by the generation, management, handling, transport and disposal of toxic and dangerous products and wastes. The health and safety situation prevailing at the shipbreaking yards continued to remain critical, especially in Mumbai, where the working conditions and the quality of facilities remain highly inadequate for guaranteeing health and safety at work and an adequate standard of living for those employed in the shipbreaking sector. Shipbreaking was noted to be of grave concern, noting that during the dismantling process, workers are exposed to a wide range of hazardous workplace activities, such as entry into confined, enclosed or other dangerous atmospheres, paint removal, oil/fuel removal and tank cleaning, which may cause death, permanent or temporary disabilities, and injuries. Furthermore, long-term exposure to toxic and hazardous substances and materials which may be present on ships sent for dismantling, such as asbestos, polychlorinated biphenyls (PCBs), heavy metals in paints, oils and oil sludge, may lead to serious or irreversible work-related illnesses and diseases, including lung diseases, several forms of cancer and asbestos-related illnesses. At the time of the former Special Rapporteur's visit, the 128 yards that were operational provided employment to about 30,000 workers. In addition, over 500,000 workers were employed in associated downstream industries, such as re-rolling mills, foundries, scrap-handling yards, local	• Inadequate standards of protection • Monitoring and enforcement gaps • Opaque supply chains and the transfer of hazardous work • Exploitation of those most at risk • Failures to realize the right to information • Limited progress in prevention of exposure • Informal economy • Restrained freedom of association • Inaccessible remedies, justice

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goods stores and other small businesses.

Most of the shipbreaking workers at Alang/Sosiya and Mumbai were migrant workers coming from poorer, less industrialized states of the Union, such as Uttar Pradesh, Orissa and Bihar. Many workers would go back to their villages for three to four months a year, usually during the monsoon season, to work in agriculture, likely exposed to a different type of occupational toxic substances. It was a largely uneducated workforce, relatively young (19-45 years old) and mostly male. Most of the workers are either illiterate or have attended primary levels of schooling. A large percentage of workers are married, but only 20 per cent of them live with their families.

The former Special Rapporteur noted the development of training opportunities for some workers. The Safety Training and Labour Welfare Institute, established in 2003 in Alang, provided a number of training programmes, seminars and workshop aimed at raising awareness on the risks associated with ship-dismantling activities and on the measures to adopt to minimize such risks. From 2003 to 2009, some 49,000 workers participated in training activities at the Institute. The "basic safety for all" programme was compulsory for all workers in the yards. The former Special Rapporteur also noted the progressive introduction and use of basic PPEs, such as helmets, gloves and goggles, reportedly contributing to the reduction in the number of serious accidents resulting in death or disabilities. The Special Rapporteur welcomed the efforts made by the local authorities and the shipbreaking industry to improve the health and quality of life of workers and their families in Alang/Sosiya.

Notwithstanding these positive developments, the health and safety situation prevailing at the shipbreaking yards continued to remain critical, as witnessed by the 12 fatal accidents that occurred in Alang/Sosiya during the course of 2009, and there are a number of identifiable shortcomings which need to be addressed. The former Special Rapporteur was particularly concerned about the quality of infrastructure facilities in Mumbai, which continue to be highly inadequate for guaranteeing health and safety at work and an adequate standard of living for those employed in the shipbreaking sector.

The informal nature of shipbreaking activities hampers the effective implementation of national labour standards aimed at guaranteeing job security and just and favourable conditions of work. There is no written contract of employment. Workers were hired either on a monthly basis or for a specific task on a vessel. They regularly change plots, depending on the arrival of ships and workload. Workers were paid monthly, usually at the daily rate. The average daily rate is 250 rupees a day (about US$ 5). Working hours are from 8 a.m. to 5 p.m., but reportedly there is a two-hour compulsory overtime every day until 7 p.m. in most yards. Workers can be fired at any time with no prior notice and with no reasonable ground.

The former Special Rapporteur considered that the absence of a written contract of employment, and the possibility of dismissal overnight, are at the core of the vulnerability of shipbreaking workers, and de facto prevent the full and effective enjoyment of the core labour rights enshrined in articles 6, 7 and 8 of the Covenant.

Report	References to occupational exposures	Challenges faced by workers
	With a few exceptions, the vast majority of the workforce in Mumbai do not receive any information on the hazards or risks to health and safety, nor do they receive any training on how to avoid or minimize them. With regard to safety training, the former Special Rapporteur was of the view that existing training opportunities in Alang/Sosiya should be improved, considering the magnitude of the risks associated with shipbreaking activities and the hazardous substances workers are potentially exposed to. In Mumbai, workers do not receive any formal training from their employers, which makes them more prone to serious accidents and injuries. As far as PPEs are concerned, the former Special Rapporteur regrets that not all the workers in Mumbai receive helmets, gloves and goggles, and that only a fraction of them actually use them during work. Due to the informal nature of working arrangements, workers are not covered by social protection schemes, and do not receive any benefit in case of work-related injuries or diseases. The compulsory insurance that the industry is required to have covers only death and permanent disabilities. In cases of minor accidents, employers usually pay for first aid and immediate medical expenses, but not for long-term medical treatment or for expenses linked to chronic work-related illnesses. Workers do not usually receive any wages or benefits when absent from work on medical grounds. Health facilities in Alang/Sosiya do not possess sufficient human, technical and financial resources to provide any treatment other than first aid for minor injuries. The nearest hospital equipped to deal with life-threatening conditions is in Bhavnagar, more than 50 kilometres away. The Red Cross hospital in Alang, which the former Special Rapporteur visited, can count on only four medical doctors and nine beds to provide health care not only to some 30,000 workers in the yards, but also to the neighbouring villages of Alang (which has a population of about 18,000 people) and Sosiya (4,000 people). In Mumbai the situation is even worse, with no permanent facilities except first aid and ambulance services. The former Special Rapporteur notes with concern that most workers, but reportedly also a number of yard owners, are not aware of the serious life-threatening work-related diseases which may result from long-term exposure to toxic and hazardous substances and materials present on end-of-life ships. In particular, it appears that the majority of the workforce and the local population do not know the adverse consequences of prolonged exposure to asbestos dusts and fibres and are not familiar with the precautions that need to be taken to handle asbestos-containing materials. The former Special Rapporteur also reported on the situation of workers handling electronic waste (e-waste). The term "e-waste" is generally used to describe obsolete, broken or discarded appliances using electricity, such as computers, mobile phones and household appliances. E-waste may contain a number of hazardous substances, which can be released in the workplace and in the surrounding environment during the separation and recovery process. At the time, it appeared that only 3 to 5 per cent of e-waste is recycled in authorized recycling facilities. The vast majority of electrical and electronic equipment (EEE) was collected, dismantled and processed in the informal sector by some 80,000 workers, including women and	• Inadequate standards of protection • Limited progress in prevention of exposure • Monitoring and

Report	*References to occupational exposures*	*Challenges faced by workers*
	children, who earn their livelihood by breaking down old computers and other high-tech devices to recover precious metals such as gold, copper and silver. The work is done largely by hand, using rudimentary techniques. Workers recovering glass by hammering cathode ray tubes or heating PCBs to remove capacitors are a common sight in most workshops dismantling e-waste. Workers did not use any protective gear to guard against hazardous substances released during the breaking of obsolete EEE. The Delhi area is the main hub for informal recycling of e-waste in India, with about 25,000 workers engaged in the various stages of the process. The recycling business is based on a network of collectors, traders and recyclers. Each phase of the process adds value to the materials and creates job opportunities for a great number of people. The e-waste market was not centred in one main area, but spread around different zones, each handling a specific stage of the process (for example storage, component separation, plastic shredding, acid processing/leaching, open burning and residue dumping). At the time, legislation on waste management has not proved effective in informal sectors, and was regarded as not providing sufficient protection for the estimated 80,000 persons working in the informal e-waste recycling sector and their families. The failure to incorporate the informal sector into Government strategies on the sound management and disposal of e-waste constitutes, in the former Special Rapporteur's view, a violation of the obligations undertaken by the State under articles 6, 7 and 11 of the International Covenant on Economic, Social and Cultural Rights. The former Special Rapporteur is concerned about the extremely dangerous recovery processes and techniques used in the informal e-waste recycling sector and their adverse effects on the right to health of those employed in small-scale informal workshops. Such health-threatening practices include the physical breaking of hazardous components, open-air incineration and acid leaching to extract gold and copper, and the melting of lead. Most of these activities involve physical dismantling by bare hands and basic tools. Workers were observed to not use any protective gear to prevent exposure to the hazardous substances contained in EEE; indeed, most of them possessed very little or no knowledge of the risks associated with the handling of these hazardous substances or the precautions to use to minimize their adverse health effects.	enforcement gaps • Exploitation of those most at risk • Opaque supply chains and the transfer of hazardous work • Disconnected efforts on occupational and environmental health • Informal economy • Failures to realize the right to information
"Medical Waste" **(A/HRC/18/31) (2011)**	Each type of hazardous medical waste presents hazards that jeopardise the enjoyment of human rights by workers and others. The 2011 thematic report contained several examples of the adverse impact that the improper management and disposal of medical waste continue to have on the enjoyment of human rights in many countries. All individuals exposed to health-care waste are potentially at risk of being injured or infected, including medical staff: doctors, nurses, sanitary staff and hospital maintenance personnel; workers in support services linked to health-care facilities such as laundries, waste-handling and transportation services; and workers in waste-disposal facilities, including scavengers. While all persons exposed to hazardous medical waste are at risk of health impacts, the main occupational groups at risk include hospital personnel, workers handling and transporting waste, persons working at waste disposal facilities, and scavengers. In many developing countries, nurses and (to a lesser extent) doctors do not receive adequate information on the hazards	• Inadequate standards of protection • Exploitation of those most at risk • Failures to realize the right to information • Limited progress in prevention of exposure

Report	References to occupational exposures	Challenges faced by workers
	associated with the unsafe handling of hazardous medical waste, nor do they receive any training on how to eliminate, or reduce to a minimum, such hazards. Medical personnel often receive limited instructions on the use of personal protective equipment, and are not aware of safety emergency procedures for dealing with spillages (for example, when mercury-containing equipment breaks) and accidents. In some health-care establishments, staff members are not vaccinated against common infectious diseases, such as tetanus and hepatitis. Hospital cleaners and waste handlers are in an even more vulnerable position than the medical staff that produce the waste. An increasing number of them are employed by external contractors rather than being directly employed by the hospital, and may not receive any information on the occupational risks to which they are exposed and on the correct procedures for handling, loading and unloading waste bags and containers. They are often poorly educated, and often do not receive any vaccinations or proper personal protective equipment. Disposable latex gloves may be provided, but they are usually thin and offer little protection. In many health-care establishments, it is not uncommon to see medical waste being transported by hand in bin bags, risking spills of toxic or infectious liquids, or staff injuries from protruding needles or other sharp objects. Like hospital cleaners and waste handlers, operators of small-scale medical waste incinerators, garbage collectors and people working in municipal waste facilities, where large amounts of medical waste are mixed and disposed of with general household waste, are unlikely to receive proper training on the risks associated with the handling of hazardous medical waste or protective clothing, including gloves against needle-stick injuries. They do not usually receive any vaccinations against common infectious diseases. Untreated medical waste can reach the recycling industry by a number of routes. In many developing countries, where hospitals have no recycling programmes, staff at healthcare facilities often sell medical waste to waste recyclers in order to supplement their incomes. This practice allows for the reuse and recycling of a large amount of non-hazardous hospital materials, such as empty bottles and containers or aluminium from vial caps. Other materials, such as syringes, blood bags or laboratory waste, are, however, extremely hazardous, and the practice puts whoever processes these products at risk. Waste recyclers usually have no formal education and possess very little or no knowledge of the risks associated with the handling of hazardous substances or the precautions to adopt to minimize their adverse health effects. They usually use no protective gear to prevent them from exposure to the hazardous substances contained in medical waste. Medical waste is also sought out by scavengers, who put themselves at great risk by collecting it. In some countries, scavengers are often seen in hospital grounds, while others collect waste from municipal dumps or at illegal landfills. In December 2007, for instance, a large number of scavengers, mainly children, were suspected to have contracted hepatitis C as a result of needle-stick injuries during the collection of used syringes and other clinical waste for recycling. Even in countries where there is less of a recycling industry, the practice of mixing medical waste with ordinary garbage exposes scavengers to a number of infectious diseases, such as hepatitis and tetanus, and to physical risks associated with the handling of infected needles and broken glass.	• Monitoring and enforcement gaps • Informal economy • Disconnected efforts on occupational and environmental health • Inaccessible remedies, justice and accountability

Report	*References to occupational exposures*	*Challenges faced by workers*

Information on the hazards associated with the handling of hazardous medical waste, access to training opportunities on the safety procedures to minimize hazards, and proper personal protective equipment were noted to constitute essential preconditions for the enjoyment of the right to safe and healthy conditions of work. In many health-care establishments around the world, the lack of adequate waste management plans to ensure the safe and environmentally sound segregation, collection, transport, treatment and disposal of medical waste continue to expose a significant number of people from a wide range of occupations to the risk of injury and illness.

The report notes that WHO has elaborated a number of policy, management and advocacy tools to minimize the risks that the improper management of health-care waste pose to health-care workers, patients, waste handlers, the community at large and the environment, and to facilitate the establishment and sustained maintenance of a sound system of health-care waste management.

In most developing countries and economies in transition, the lack of adequate technical resources for the safe and sound management of health-care waste, the limited funding for health-care waste management and the inadequate awareness of the direct and indirect risks posed by health-care waste constitute the main obstacles to the development of a comprehensive regulatory framework on health-care waste management and to its effective implementation.

The former Special Rapporteur recommended that States strengthen their legal framework on hospital hygiene and occupational health and safety, and provide adequate human, technical and financial resources to national authorities responsible for its enforcement. He also recommends that health authorities organize educational programmes and training opportunities to raise awareness about health, safety and environmental protection issues relating to medical waste management.

In view of the fact that persons working within and outside health-care establishments often receive limited information and training opportunities on the occupational risks to which they are exposed and on the correct procedures for handling waste in a safe manner, the former Special Rapporteur urged relevant national health authorities to include waste management in the curricula of future medical practitioners and nurses, to provide appropriate information on the occupational risks to which medical and paramedical staff may be exposed, and to organize training opportunities on safe health-care waste management for staff handling medical waste.

The former Special Rapporteur called on health-care establishments to take all appropriate measures to improve health and safety conditions for those handling medical waste in and outside health-care establishments. Such measures should include: (a) Access to information on the specific occupational risks to which different categories of workers are exposed, and the safety measures to minimize such risks; (b) The provision of appropriate personal protective equipment for persons handling hazardous health-care waste; (c) Access, on a voluntary basis, to vaccination against such common infectious diseases as tetanus and hepatitis; (d) The organization of training opportunities and safety workshops designed for and targeting different categories of hospital personnel (such as medical doctors, nurses, hospital cleaners and waste handlers); (e) Regular

Report	References to occupational exposures	Challenges faced by workers
	drills in emergency prevention, preparedness and response procedures. The former Special Rapporteur recommended a number of principles be taken into account while drafting and implementing such health-care waste management plans, some of which relate to the protection of workers in the healthcare sector from exposure to hazardous substances and wastes: Prevention/minimization of hazards — The former Special Rapporteur called on States, healthcare facilities and the private sector to take all appropriate measures, including educational programmes and improved production processes, to ensure that the generation of hazardous medical waste is reduced to a minimum. Hospitals should, whenever feasible, replace hazardous chemicals/products (for example, mercury-containing devices) or disposable instruments (such as scissors and kidney dishes) with alternative products or reusable products. Prescription practices should also be changed so that unnecessary injections in cases where effective oral medical is available may be avoided. Packaging and labelling — The use of internationally recognized symbols and signs is essential to ensure the safe handling of hazardous waste. A common system of labelling and coding of packaging should be used in all health-care establishments and be part of the waste management instructions for hospital workers who handle hazardous waste. Medical waste should be packaged in resistant and sealed bags or containers to prevent spilling during handling and transportation. If shipped abroad for treatment, medical waste should be labelled in accordance with international agreements (such as the Basel Convention). Handling, transportation and storage — Medical waste should be handled and transported in such a way as to prevent unnecessary exposure to staff and others. Handling and transportation should be minimized to reduce the likelihood of exposure to the waste. Medical waste should be held in storage areas that are identified as containing infectious waste. Such areas should always be fitted with a lock in order to prevent access by unauthorized persons.	
"Mission to Poland" **(A/HRC/18/31/Add.2) (2011)**	The former Special Rapporteur noted with concern that national authorities responsible for monitoring compliance with national legislation including in relation to health and safety at work frequently lacked adequate human, technical and financial resources to carry out their monitoring functions adequately. Small and medium enterprises were inspected only once every four years, and only big industrial and agricultural enterprises were subject to more regular controls. The former Special Rapporteur recommended that Poland allocate adequate human, technical and financial resources to the various agencies responsible for enforcing and monitoring compliance with national legislation on environmental protection, waste and chemicals management, and health and safety at work. The former Special Rapporteur shared the concerns expressed by the Committee on Economic, Social and Cultural Rights that that Poland had not at the time taken the necessary measures to ensure that the Covenant is given full effect in its domestic legal order. In this regard, the Special Rapporteur noted that some of the economic and social rights enshrined in the Constitution, including the right to safe and healthy working conditions and the right to a healthy environment,	• Inadequate standards of protection • Monitoring and enforcement gaps • Failures to realize the right to information • Limited implementation of ILO instruments

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	could not be directly invoked before national courts and tribunals. The former Special Rapporteur noted that Poland was not a party to a number of ILO conventions on health and safety at work, and called on the Government to consider ratifying these conventions, in particular the Convention concerning Occupational Safety and Health and the Working Environment, 1981 (No. 155) and the Convention concerning the Prevention of Major Industrial Accidents, 1993 (No. 174).	
"Human rights and Extractive Industries" **(A/HRC/21/48) (2012)**	The report surveys the human rights impacts to workers engaged in mining from exposure to hazardous substances. Mining is considered one of the world's most dangerous occupations. Workers are exposed to intense heat, toxic substances and fumes, unstable geological structures and intense sounds. Inadequate safety protocols in the handling, storing and disposal of toxic substances are contrary to international human rights treaties protecting the right to safe and healthy working conditions. For example, more significant health effects have been found among uranium miners who are exposed to high levels of radon. A well-known and potentially fatal respiratory disease affecting extractive industry workers is coal worker's pneumoconiosis, or black lung disease, which causes the lungs to inflame and stiffen from scarring. Another potentially debilitating and fatal outcome of exposure to coal dust is silicosis. Disturbingly, up to 12 per cent of coal miners develop these two deadly diseases. Despite increasing global consensus of the dangers of mercury, the former Special Rapporteur expressed concern that miners and their families are still exposed to this hazardous substance and neurotoxin; miners in Brazil, Colombia, Guyana, Indonesia, the Philippines, United Republic of Tanzania and Zimbabwe were recorded with mercury levels of up to 50 times above the limits set by the World Health Organization (WHO). A study by the National Institute for Occupational Safety and Health (NIOSH) and the National Cancer Institute of the United States of America showed a direct relationship between diesel exhaust and lung cancer. Underground miners are exposed to over 100 times the background concentrations of diesel exhaust, and the use of diesel-fuelled equipment is growing in the mining community. Not surprisingly, the study found that underground miners, who have the greatest exposure to diesel exhaust, have a higher lung cancer mortality rate than surface miners, as well as elevated oesophageal cancer and pneumoconiosis. In most cases, children working in extractive industries constitutes one of the worst forms of child labour. The 2012 report notes ILO estimates that one million children worldwide are involved in mining and quarrying, and often with little or no pay; UNEP estimates put that number at between one million and two million. Children as young as 3 years work in dangerous conditions which expose them to hazardous substances, including mercury, lead and cyanide. The mines are often too remote to have regular labour inspections, and they do not have unionized workers, resulting in the so-called "frontier communities" where traditional social structures of society and ethical value systems have broken down. Mercury intoxication has been called an epidemic among children working in gold mines. The	• Inadequate standards of protection • Limited progress in prevention of exposure • Monitoring and enforcement gaps • Exploitation of those most at risk • Informal economy

report notes that one-fifth of the children covered by an International Labour Organization (ILO) survey reported having a health problem since they took up gold mining, primarily aches in limbs and backbone, kidney and urinary tract diseases and exhaustion. In one country, over 400 children under the age of five reportedly died due to lead poisoning associated with gold miners grinding lead-containing rock at home in order to extract the gold, and leaving lead dust on the floors where children crawl. Health risks related to exposure to hazardous substances is exacerbated by children's inclinations to more hand-to-mouth behaviour as well as the fact that personal protective equipment (PPE) is invariably made in adult sizes.

Impacts on maternal health from exposure to hazardous substances, especially during the already immune-challenged gestation period, was also noted. The former Special Rapporteur expressed alarm at the discovery of elevated mercury levels in the breast milk of mothers in several countries. He expressed concerned that this may diminish the rights of infant children, reduce the practice of breastfeeding and increase the likelihood for women of diseases associated with exposure to these substances.

The report notes how women experience the impacts of artisanal and small-scale mining(ASM) differently, either because of their sex — their biological characteristics as a female —, but more often because of their gender — their sociocultural definition as women. The former Special Rapporteur emphasizes that due to the harmful effects of mercury on the female reproduction function, international human rights law requires States parties to put in place preventive measures and programmes to protect women of childbearing age from mercury exposure.

The former Special Rapporteur expressed concern about the extent of child slavery and child labour in the mining and quarrying industries and the impact on children as they face the same risks as adults, but lack the strength and judgment to protect themselves from sexual, moral, social and physical harm, including death and injuries resulting in disabilities. Poverty, lack of access to education, insufficient or non-existent legal frameworks, trafficking and debt bondage have been identified as root causes, manifestations and aggravating factors that lead to child slavery in the mining and quarrying sector. The former Special Rapporteur observed that unaccompanied minors are more likely to be exposed to harmful substances for want of parental protection in already exploitative environments.

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	The report notes several International Labour Organization (ILO) conventions concern the occupational hazards facing workers in extractive industries.[3] Despite the robust and varied protection offered by the ILO conventions, the former Special Rapporteur stressed what he considered their three primary shortcomings. First of all, the lack of widespread ratification (ranging from 6 to 57 countries) of these conventions means that global commitment to the full extent of the standards articulated is difficult. Secondly, implementation remains a substantial problem in States that have ratified some or all of these conventions. Indeed, several States parties to Convention No. 169 fail to adequately consult indigenous peoples prior to development and promotion of an extractive undertaking, despite the requirement under the Convention to establish or maintain procedures for consultation with affected indigenous communities, "with a view to ascertaining whether and to what degree their interests would be prejudiced, before undertaking or permitting any programmes for the exploration or exploitation of such resources pertaining to their lands" (art. 15, para. 2). With regard to asbestos extraction, Convention No. 162 has been somewhat successful in reducing asbestos extraction and consumption around the world from an estimated 4.73 metric tons in 1980 to about 2.11 metric tons in 2003. However, despite the adoption of the resolution concerning asbestos in 2006, which endorsed the "elimination of future use of asbestos," extraction and use of asbestos remains alarmingly high (in some cases, production has increased), including in countries that have ratified the Convention. Thirdly, the obligations contained in the conventions are often inadequate to address the problems related to hazardous wastes. For example, Convention No. 169 only requires consultation with	• Limited implementation of ILO instruments

[3] Convention No. 148 concerning the Protection of Workers against Occupational Hazards in the Working Environment Due to Air Pollution, Noise and Vibration states that, "as far as possible, the working environment shall be kept free from any hazards due to air pollution, noise or vibration."33 • Convention No. 155 concerning Occupational Safety and Health and the Working Environment requires parties to establish a coherent national policy on occupational safety and health in order to improve working conditions. • Convention No. 162 concerning Safety in the Use of Asbestos obligates States parties to prescribe measures to protect workers from exposure to asbestos, including partial or total bans on future asbestos use, and thus its extraction; proper asbestos waste disposal; inspection and monitoring procedures of working conditions; and providing information on the hazards of asbestos to workers. • Convention No. 170 concerning Safety in the Use of Chemicals at Work compels States parties to protect workers from exposure to hazardous chemicals. Employers in States parties to the Convention are obligated to classify and identify hazardous chemicals so as to ensure that workers are not exposed to hazardous chemicals in excess of exposure limits, and to minimize risk. • Convention No. 174 concerning the Prevention of Major Industrial Accidents obligates States parties to "formulate, implement and periodically review a coherent national policy concerning the protection of workers, the public and the environment against the risk of major accidents" (art. 4) and "establish a comprehensive siting policy arranging for the appropriate separation of proposed major hazard installations from working and residential areas and public facilities" (art. 17). • Convention No. 176 concerning Safety and Health in Mines establishes standards for all mining operations, excluding oil and gas extraction. Parties to the convention must consult with representatives of employers and workers to formulate a policy on safety and health in mines consistent with the minimum standards set out in the Convention. 34 • Convention No. 169 concerning Indigenous and Tribal Peoples in Independent Countries recognizes the need for special safeguards of the rights of indigenous peoples to the natural resources, including mineral or sub-surface resources, pertaining to their lands, including the right to participate in the use, management and conservation of these resources and in the benefits of their extraction. 62.

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	affected indigenous and tribal peoples in decision-making on the extraction of natural resources and only provides for compensation for damage from harms caused by such extraction rather than mitigation, which could be accomplished through a robust free, prior and informed consent procedure. Likewise, the other conventions mentioned above contain critical qualifiers to obligations based on "national conditions and practice" which can result in reduced standards in some countries on the grounds that they lack the resources to meet obligations under one or more conventions.	
"Preliminary and scoping report" **(A/HRC/24/39) (2013)**	The report notes that, unlike most other areas of international environmental law, there is neither a framework Convention nor a comprehensive global regime on the regulation of toxic chemicals and wastes. Fewer than 30 of thousands of toxic substances are regulated through their lifecycle under international conventions. The report notes that the impact of substances on human health and the environment can be reduced by limiting or prohibiting the use of these substances in certain industrial processes, where substitutes or alternative processes exist. These restrictions were first designed to protect the health of workers. For example, the ILO adopted a Convention prohibiting the use of certain pigments of lead in industrial paint to prevent the exposure of workers to the risk of lead poisoning. In 1971, another Convention was adopted by the ILO to restrict the use of benzene or products of benzene in certain industrial activities, while demanding the replacement of these carcinogens produced by less harmful substitutes.	• Inadequate standards of protection • Disconnected efforts on occupational and environmental health • Limited implementation of ILO instruments
"Mission to Hungary" **(A/HRC/24/39/Add.1) (2013)**	In Hungary, when a reservoir containing red sludge collapsed, the most serious immediate effects were caused by the high alkalinity (pH 13+) of the sludge. The people of Devecser and Kolontár experienced serious first- and second-degree chemical burns to the skin; respiratory problems were also documented. In addition, the health of some 4,000 volunteers and rescue workers were similarly affected. The former Special Rapporteur attached great importance to the issue of occupational health during rescue operations, and reiterated the recommendation of WHO that personal protective equipment should be selected on the basis of the hazards identified, the protective qualities of the equipment and its suitability for the tasks performed. The former Special Rapporteur was concerned by information he received indicating that there are no special protocols for the rescue of children, the elderly, persons with disabilities or other persons in need of protection in the training programme developed for disaster management forces in Hungary. The former Special Rapporteur recommended that the Government of Hungary: (a) Consider accession to the Protocol on Liability and Compensation for Damage resulting from Transboundary Movements of Hazardous Wastes and their Disposal and to contribute to its entry into force; (b) Consider ratifying the ILO Chemicals Convention, 1990 (No. 170) and the Prevention of Major Industrial Convention, 1993 (No. 174) to strengthen the framework for occupational safety. The former Special Rapporteur also recommended among other measures that the Government of Hungary in the mining law place emphasis on provisions that provide for meaningful engagement with affected communities and for the safety of workers, especially those dealing with harmful substances; and ensure that impact assessments use reliable baseline studies	• Inadequate standards of protection • Monitoring and enforcement gaps • Exploitation of those most at risk • Disconnected efforts on occupational and environmental health • Failures to realize the right to information • Limited implementation of

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	for both environmental contaminants and human health conditions, and are carried out by competent authorities to ensure an environmentally sound reflection of the impact of contaminants on the environment and human health of proposed developments.	ILO instruments
"Right to information on hazardous substances and waste" **(A/HRC/30/40) (2015)**	The Special Rapporteur's report describes the rights of workers and others in relation to right to information. The report contains obligations of States and responsibilities of business enterprises in relation to the right to information. It clarifies that information on hazardous substances should be available, accessible and functional for everyone, consistent with the principle of non-discrimination, in order for States to meet their human rights obligations and businesses their corresponding responsibilities. The Special Rapporteur noted with concern that workers are exposed to above-average levels of hazardous substances, with regular reports of inadequate training and adverse health impacts from preventable accidents and occupational exposure. The Special Rapporteur also noted the right of workers to remove themselves from situations they believe are hazardous, which is contingent on information about the known and unknown risks of the substances to which they are exposed. The reports notes that in order to protect those most at risk, States must ensure that disaggregated information is available and accessible regarding the risks of hazardous substances to various population groups, such as workers, children or pregnant women. Similarly, the information should be monitored and disaggregated by sex and population group, such as workers in industries with exposure to hazardous substances, low-income communities, indigenous peoples or minorities, or other groups who are at high risk of adverse impacts. In addition, States must ensure information flows effectively to communities at risk to enable them to be aware of risks and options to prevent harm. Disaggregated information on adverse effects linked to hazardous substances, such as cancer, can help to identify those at risk of disproportionate impacts, and help to provide an effective remedy. In addition, bio-monitoring initiatives can also help to provide disaggregated information, for example on hazardous substances in mother's breast milk passed onto children. To help overcome the challenge of making information accessible to workers and others at risk, a long-standing tool nationally and internationally is classification and labelling. These laws help to ensure businesses, workers and the public have access to information about the risks associated with hazardous substances in the workplace. To this end, States have pledged to implement "hazard communication mechanisms",[4] such as the Globally Harmonized System of Classification and Labelling of Chemicals, and to use safety data sheets. Training of workers is required for these tools to work effectively.	• Failures to realize the right to information

[4] SAICM, Overarching Policy Strategy (see footnote 13 above), para. 15 (b) (ii).

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"Impact of Toxics and Pollution on Children's Rights" **(A/HRC/33/41) (2016)**	The illegal use of banned pesticides and toxic chemicals, as well as of counterfeit products, continues to be a major problem globally, a serious threat to children of the workers affected, to communities and to consumers. Tens of millions of children are engaged in hazardous work, where they are often exposed to toxic chemicals. For example, children around the world continue to work in artisanal and small-scale mines, where they are exposed to mercury and other toxic chemicals. The United Nations Children's Fund (UNICEF) has estimated that 40,000 children toil in mines, extracting a known carcinogen (cobalt) to be used in cell phones, laptop computers and cars by companies that undoubtedly have resources for human rights due diligence. Children working in agriculture continue to use hazardous pesticides despite the bans on such products in several countries, raising questions of double standards and discrimination. Childhood exposure to toxics occurs without the child's (or parent's) consent. Even if a parent were somehow able to identify every product and possible source of exposure to toxics that might harm their child, they are often powerless to do anything about it, particularly when it involves food, water or air pollution. Young children lack the physical and/or mental ability to vocalize opinions and understand the dangers and potential consequences of toxics until long after harm has been inflicted. This, for example, is why children are not allowed to buy cigarettes or alcohol until a certain age in many countries and are prohibited from working in hazardous conditions. As parents' exposure to toxic chemicals can affect the development of the child, this is inextricably linked to the realization of several rights of the child. Cases of children born with disabilities because their mothers worked with toxic chemicals before or during pregnancy, or harmed by toxic residues brought into the home from work ("take-home exposures") by their parents or others illustrate the importance of protecting not only women and girls of reproductive age, but the population at large. Examples of addressing certain sources of exposure to toxics by young children include the European Union directive on the safety of toys, which prohibits the presence of substances in toys that are classified as carcinogenic, mutagenic or toxic for reproduction, and United States legislation to protect children working on tobacco farms from toxic pesticides.101 Globally, a new treaty on mercury pollution holds promise, but only addresses one element of a much larger problem. States and businesses still have a long way to go. The importance of upstream prevention is illustrated by the case of children working in cobalt mines in the Democratic Republic of the Congo. Reports describe children in Indonesia and Peru poisoned by mercury and suffering from birth defects due to small-scale gold mining. Companies that purchase or invest in such commodities have a responsibility to ensure that child rights are not violated as a result of their demand. At the tail end of industrial activity, children are far too often found working at toxic waste dumps, burning plastics and cables to recover and recycle precious metals. Electronic waste (e-waste) is of particular concern. Children, sometimes as young as five, are involved in manual dismantling and burning of electronic products at e-waste sites in Africa, Latin America and Asia. Some are described as being among the most polluted places on earth. Infants living near waste	• Inadequate standards of protection • Limited progress in prevention of exposure • Monitoring and enforcement gaps • Exploitation of those most at risk • Deliberate efforts to delay or obstruct protection from toxic exposure • Opaque supply chains and the transfer of hazardous work • Disconnected efforts on occupational and environmental health • Failures to realize the right to information • Inaccessible remedies, justice and accountability • Informal economy

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	disposal sites, due to their hand-to-mouth behaviour, are among the most vulnerable groups, as soils and dusts are generally contaminated with lead and other toxics. In Latin America, many of these recycling and recovery operations take place in communities, not in clearly defined waste dumps. Children are found with record levels of toxic chemicals in their bodies at such waste sites. Young girls, still developing and approaching the age of reproduction, work as collectors or vendors in highly toxic environments. At La Chureca in Managua, Nicaragua, approximately half of all waste pickers were less than 18 years old. 134 In Guiyu, China, about 80 per cent of children suffer from respiratory diseases, and there has been a surge in cases of leukaemia and concentrations of lead in blood are high. The Special Rapporteur offered various recommendations to stakeholders to protect the rights of the child from toxic chemicals, including that: States should eliminate work by children where they are exposed to toxics and ensure safer alternative employment, and monitoring of children affected. States should ensure that children affected receive the necessary treatment and compensation. States should also ensure that women and girls of reproductive age are guaranteed protection from occupational exposure to toxics and the substitution of toxics with safer alternatives as the primary means of prevention; International organizations should integrate the problem of toxic chemicals, pollution and waste into the work of their organization, based on their respective competencies, and monitor and report on the issue; and increase efforts to reduce the exposure of children and women of reproductive age to toxic chemicals, particularly of child workers and those living in high-risk situations.	
"Mission to Republic of Korea" **(A/HRC/33/41/Add.1) (2016, mission carried out in 2015)**	During the mission, the Special Rapporteur examined the rights of workers who may develop diseases or other injuries on account of their exposure to hazardous substances. Workers in the Republic of Korea have the right to a healthy workplace. The report notes a long history of illness among workers in the electronics sector as a result of exposure to toxic chemicals. For example, a study of nearly 32,000 workers at IBM between 1969 and 2001 showed that "male manufacturing workers were around 60-80 per cent more likely to have died from cancers of the kidney, skin, brain and central nervous system". Given the prominent role of electronics in the Republic of Korea in recent decades, the Special Rapporteur paid close attention to how the Government and businesses were protecting and respecting the human rights of workers in the electronics sector to a safe and healthy workplace. In the electronics industry, chemical substances are used in the manufacture of devices, including in displays, semiconductor chips, casings and batteries and other component materials. There is a significant likelihood that workers may be exposed to hazardous substances, which can lead to serious health impacts such as cancer, infertility, birth defects, respiratory illness and disruption of hormone (endocrine) systems. Former workers in the electronics industry in the Republic of Korea began to be diagnosed with leukaemia around 2005. Yumi Hwang, a former Samsung Electronics employee, died of acute myeloid leukaemia in March 2008. She was diagnosed 20	• Inadequate standards of protection • Exploitation of those most at risk • Inaccessible remedies, justice and accountability • Failures to realize the right to information • Opaque supply chains and the transfer of hazardous work

months after she began working, at the age of 19, as an operator in production line No. 3 at the Samsung Electronics Giheung Plant.

As of January 2015, more than 350 former workers in the electronics industry, of which approximately 130 have died, had alleged that they had developed various diseases. Victims had suffered from cancer, including lymphoma, malignant brain tumours, myelogenous leukaemia and non-Hodgkin's lymphomas, as well as aplastic anaemia, reproductive abnormalities and other health impacts. All former workers described to the Special Rapporteur were young females, including several in their early twenties. With many female workers of childbearing age, the alleged victims extend to the children of former workers. For example, the Special Rapporteur heard from a mother who had been pregnant during her employment and subsequently given birth to a child with birth defects. The Special Rapporteur heard testimony from former Samsung workers (all women) and their family members about tasks performed in the manufacture of semiconductor chips, such as dipping semiconductors into a chemical solution by hand to remove unnecessary parts and manually sorting and testing chips under high temperatures or voltages, releasing fumes. Former workers explained that they would still smell fumes from the workplace long after returning home. Neither the former workers nor the family members of the deceased could name the substances they had used in the workplace.

The former workers of Samsung Electronics also described the pressure that they worked under at the time to meet production targets. They explained that they were often in a state of chronic fatigue and stress due to their 12-hour rotating shifts, working six days a week in addition to preparing for regular mandatory exams outside of working hours (unpaid). They described the constant pressure placed on them to train and to pass tests to perfect their workmanship, along with pressures not to unionize and insufficient training on chemical safety.

Samsung would not disclose which substances were used during the time of employment of the alleged victims, claiming that it was confidential business information. Samsung explained that it does require suppliers to submit a letter of warranty *that chemical formulas purchased do not* contain hazardous substances. The Special Rapporteur reiterates that, under international laws, global policy frameworks and national law, health and safety information on hazardous substances should not be confidential.

Samsung Electronics claims no hazardous substances are used in its production processes. Information was not provided by the company to justify this claim, clarify the categorization of "hazardous" or to explain if and when changes to chemicals used in production processes were implemented.

There is strong evidence that hazardous substances are used in electronics manufacturing. Apple Inc. has stated that it has eliminated or plans to eliminate the use of certain hazardous substances in the production of its electronics. Of note, many of these substances were used in Apple's electronics supply chain during the period of employment of the alleged victims at Samsung Electronics. Also, Apple has stated that it has yet to phase out certain hazardous substances in power cords in the Republic of Korea due to an inability to obtain Government approval. The

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	Special Rapporteur is deeply concerned about the withholding of or failure to generate information about toxic chemicals in order to shield corporate liability. In addition to the lack of transparency about hazardous substances used or released in the workplace, critical information about alleged victims was not disclosed by the Government, businesses or civil society to the Special Rapporteur. However, the Special Rapporteur had the opportunity to meet with several victims and victims' family members, Samsung Electronics, the Mediation Committee, and members of the Government. As of May 2016, Samsung Electronics claimed it had compensated 110 former workers affected with the specified diseases and had physically presented apology letters from the chief executive officer to those subject to compensation. The Special Rapporteur understands there are concerns regarding how the compensation process adhered to the recommendations of the Mediation Committee and encourages all parties to increase transparency and participation in this regard. Also in January 2016, Samsung Electronics reversed its previous position on "prevention". It agreed with other parties to establish a three-member Ombudsman Committee to conduct an audit of the efforts of Samsung Electronics relating to prevention and propose recommendations for improvement. The Special Rapporteur welcomes the establishment of the Ombudsman Committee, and looks forward to its implementation with both transparency and meaningful public participation by all stakeholders. The Special Rapporteur also welcomes the acceptance by SK Hynix of including miscarriage and infertility in the scope of the agreement of what would be considered for compensation, in line with safety in working conditions, including the safeguarding of the function of reproduction. As of January 2016, SK Hynix had identified and compensated 39 former workers. The long path to resolving cases illustrates the considerable difficulty workers face in demonstrating a sufficient causal relationship to realize their right to an effective remedy for the impacts of toxic chemicals. For a disease to be recognized as an occupational disease under article 5 (1) of Industrial Accident Compensation Insurance Act by the Korea Workers' Compensation and Welfare Service, there must be a "proximate causal relationship" between the worker's duties and disease. Article 34 of the Enforcement Decree of the Industrial Accident Compensation Insurance Act stipulates the specific conditions, in particular, that "causal relationship between the work-related injury and the disease should be medically recognized". In contrast to the strict standard applied by the Korea Workers' Compensation and Welfare Service pursuant to article 34 of the Enforcement Decree of the Industrial Accident Compensation Insurance Act, courts in the Republic of Korea take a more lenient approach to the issue of causation. The Supreme Court has ruled that the claimant has the burden of proving the causal relationship; however, the causal relationship need not be proven medically or scientifically but can be inferred from the consideration of various situational factors. Consideration of all the circumstances, such as the health of the worker at the time of employment, possible explanations for the disease, whether any hazardous substances existed in the workplace and the amount of time the worker spent in the workplace, makes possible the	• Inaccessible remedies, justice and accountability

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	conclusion that there is a proximate causal relationship between the worker's duties and the disease. In 2014, the Seoul Administrative Court held that the deduction can be made that there is a proximate causal relationship between the former workers' diseases and their duties. The Supreme Court also said that the question of whether a proximate causal relationship exists should be judged on the basis of the health and physical conditions of the worker concerned and not an average person. Most recently, the Seoul Administrative Court reversed the decision of the Korea Workers' Compensation and Welfare Service and acknowledged ovarian cancer to be an occupational disease. It further stressed that, for rare diseases such as ovarian cancer, a more relaxed standard for assessing causality should be applied. Noting the disparity among the Korea Workers' Compensation and Welfare Service industrial accident compensation scheme, decisions by courts in the Republic of Korea, and the dispute resolution committees established by Samsung Electronics and SK Hynix, the Special Rapporteur is concerned about the difficulty in accessing compensation under that scheme due to the high burden of proof imposed on the claimants. The Government's criteria for work-related diseases were revised in 2013. The Special Rapporteur emphasizes that States are obligated to refrain from interfering with the enjoyment of the right to social security. The burden upon the claimant to prove causation between the health impacts from which workers suffer and the hazardous substances in the workplace can be a significant inconvenience and obstacle, often because of difficulty in using or accessing information. The Special Rapporteur sincerely commended Samsung Electronics for its spirit of cooperation, openness and continuing dialogue with him. He acknowledged internal changes by Samsung Electronics and steps taken to realize the right of former workers to an effective remedy, and recommended that Samsung Electronics and other implicated businesses, among other steps ensure that all former workers and contractors harmed by toxic chemicals in the manufacture of their products are indeed compensated, at a minimum according to recommendations of the Mediation Committee.	
	One major chemical accident affecting workers in the Republic of Korea was the hydrofluoric acid leak in Gumi, which occurred on 27 September 2012 at the Hube Global chemical plant, killing 5 workers and injuring 18 others, including plant employees and emergency personnel. The damage on property, including restoration costs, amounted to 55.4 billion won. Another accident took place at the Samsung Electronics plant in Hwaseong City, where hydrofluoric acid first leaked on 27 January 2013. As a result, one person died and four were injured. Subsequently, on 2 May 2013, three external contract workers were partially exposed to diluted hydrofluoric acid at Samsung's semiconductor manufacturing facility in Hwaseong City. The workers received immediate first aid attention on site and were admitted to hospital for further examination. The Special Rapporteur welcomed the recent enactment of the Liability Act to help ensure that victims have access to an effective remedy, as well as legislative changes to prevent accidents. He also notes the studies and measures implemented by Samsung Electronics to prevent the	• Exploitation of those most at risk • Inaccessible remedies, justice and accountability

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	recurrence of similar accidents. He encouraged the State and businesses to ensure that protections apply to both employees and contractors.	
	With regard to legislation, the Special Rapporteur recommended that the Government of the Republic of Korea, among other steps:	• Inadequate standards of protection
	Ensure that all laws and policies concerning hazardous substances and wastes provide the greatest protection to those who are at the greatest risk of harm, including children, women, the elderly, communities near sources of pollution or contamination, workers and others who are at elevated risk of harm;	• Limited progress in prevention of exposure
	Undertake a robust study on the existing recourse of victims, including workers and consumers, to an effective remedy for harm that may be due to hazardous substances and wastes, paying particular attention to the burden placed on victims to establish causation, and develop and implement solutions to address challenges facing victims in accessing an effective remedy, in consideration of the recommendations contained in the findings of that study and those of the national human rights institution, as recommended below;	• Monitoring and enforcement gaps • Exploitation of those most at risk
	Ensure that information is available to prevent exposure to hazardous substances, protect human rights and ensure that victims have the information necessary to realize their right to an effective remedy in administrative and judicial systems. The Special Rapporteur underlines that States have a duty, and businesses a responsibility, to ensure that information about hazardous substances is available and accessible, and that it functions to protect the rights of everyone;	• Failures to realize the right to information • Inaccessible remedies, justice and accountability
	Increase efforts to ensure that health and safety information about hazardous substances is never confidential, and for this purpose ensure the enforcement of existing legislation or the strengthening of said legislation where necessary;	• Inaccessible remedies, justice and accountability
	Establish a centralized mechanism to monitor all human rights impacts of hazardous substances and wastes, paying particular attention to children, women, workers in all sectors and older persons, and guarantee that adequate and comprehensive prevention measures are taken as a result;	
	The Special Rapporteur also recommended that the national human rights institution: (a) Examine the challenges faced by victims of chronic exposure to hazardous substances, including workers and children, who may develop diseases many years after exposure, in establishing causation and accessing an effective remedy, and make recommendations to relevant ministries; (b) Closely examine challenges presented by victims of hazardous substances, including workers, in meeting their burden of proof in order to access an effective remedy under administrative and judicial proceedings.	

Report	*References to occupational exposures*	*Challenges faced by workers*
"Mission to Germany" **(A/HRC/33/41/Add.2) (2016, mission carried out in 2015)**	The Special Rapporteur noted how, in realizing the workers' right to information, the EU's Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation has a number of noteworthy features. First, it contains tiered health and safety requirements for all industrial substances produced or imported at or above one ton per year. This pragmatic requirement, known as "no-data, no-market", shifts the burden of proof away from public authorities and onto relevant businesses. Second, it requires industry to share information on the use of hazardous industrial chemicals up and down the supply chain to help ensure that substances are being used safely and information is current. In this way, the right to information also contributes to workers' and consumers' rights. Third, health and safety summaries are made available to Governments around the world, enabling those with fewer resources to avoid duplication of efforts and enhance cooperation. Fourth, consumers have the right to contact businesses to inquire whether a chemical linked to cancer, hormone disruption or other health and environmental hazards are found in certain products if they are on the "candidate list". Finally, the information generated is enabling businesses to transition to safer chemicals and safer products. These are good practices for the realization of the right to information about industrial chemicals, and implementation of the Guiding Principles on Business and Human Rights. One of the most innovative features of recent changes to European Union pesticides laws is the prohibition on the use of certain pesticides linked with cancer, reproductive effects, hormone (endocrine) disruption and other adverse health effects, and certain physical properties. The approach of European Union pesticides legislation is risk-based, in that the exposure levels and corresponding risks to worker health, as well as human health and the environment more broadly, cannot be adequately assured for certain pesticides with such properties. This approach to pesticides is grounded in the principle of precaution, provided in the Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community. The Special Rapporteur considers this approach of using hazard-based criteria to be in line with the universality of human rights and the uncontrollable risks that certain hazardous substances pose to those rights. It is a commendable step by the European Union to protect the human rights of everyone, including agricultural workers and children. During meetings with Bayer, the business enterprise informed the Special Rapporteur that they had a human rights policy in compliance with the FAO International Code of Conduct on the Distribution and Use of Pesticides, and a stewardship policy that they say reflects the whole life cycle of a product. For each life cycle step, Bayer says it works on best management practices with the objective of human safety, worker/operator safety, residues in food, consumer safety and environmental aspects. It also claims to work as an industry on training materials to ensure the safe use of pesticides. The Special Rapporteur was pleased to learn of Bayer's phase-out policy to remove all highly hazardous pesticides considered to be carcinogenic from their portfolio by 2012, and of its process of "portfolio screening" (covering insecticides and fungicides in 2011 and herbicides in 2015). However, he was concerned to learn that highly hazardous pesticides remain in the Bayer portfolio with no target date for phase-out.	• Inadequate standards of protection • Limited progress in prevention of exposure • Opaque supply chains and the transfer of hazardous work • Failures to realize the right to information • Inadequate standards of protection • Limited progress in prevention of exposure • Opaque supply chains and the transfer of hazardous work • Failures to realize the right to information

Report	References to occupational exposures	Challenges faced by workers
	The Special Rapporteur is concerned that, rather than substituting hazardous pesticides with safer alternatives, it would seem that Bayer prefers mitigation strategies that carry greater risks for workers and communities, such as wearing protective personal clothing and improvements on labelling. The Special Rapporteur considers that typically the only effective mitigation strategy for hazardous pesticides is a concerted effort to develop and adopt safer alternatives.	
	The Special Rapporteur also addressed the role of the German shipping industry in the abuses of human rights of workers in substandard shipbreaking facilities, particularly those in South Asia. German ship owners operate the world's fourth largest merchant fleet in terms of vessels and have been linked to widespread contamination of the food, water and air of local communities, in addition to fatalities and toxic chemical exposure among workers, including child and migrant workers, who dismantle ships in hazardous and deadly conditions. According to assessments by civil society, but disputed by the Government, in 2014, German ship owners sold a record high of 95 per cent of their end-of-life tonnage for substandard breaking on the beaches of South Asia. Despite recent progress, the extremely poor working practices and environmental conditions prevailing in many ship-breaking yards continue to be the source of widespread concern in the international community.	• Monitoring and enforcement gaps • Exploitation of those most at risk • Informal economy • Deliberate efforts to delay or obstruct protection from toxic exposure • Opaque supply chains and the transfer of hazardous work
	A major source of exposure to hazardous chemicals in Germany is in the workplace, and it is estimated that about 74,000 work-related deaths may be linked to workplace exposure to hazardous substances each year in the European Union – about 10 times more than workplace accidents. While identification and controls for carcinogens are well developed with a specific Directive for Carcinogens and Mutagens at work, there is a need to extend protection against reproductive hazards. The European Union regulation protecting pregnant women in the workplace includes a list of chemicals that is very old and not updated, which means that many chemicals of concern, like endocrine disrupting chemicals or nano-materials, are missing. According to a study by the European Agency for Health and Safety at Work, around 15 per cent of European workers report handling chemical products for a quarter of their working time and 19 per cent report breathing in dust, fumes and smoke at their workplaces. This study highlighted nanoparticles, ultrafine particles, man-made fibres, carcinogenic, mutagenic and reprotoxic substances, dermal exposures, exposures in waste management and the increasing use of allergenic and sensitizing substances as emerging risks. Specific occupations of emerging concerns include the growing waste management industry, construction and service activities such as cleaning or home nursing. In addition, there are a growing number of workers in small and medium-sized enterprises and subcontracted jobs, where	• Inadequate standards of protection • Limited progress in prevention of exposure • Monitoring and enforcement gaps • Deliberate efforts to delay or obstruct protection from toxic exposure • Disconnected efforts on occupational and environmental

Report	References to occupational exposures	Challenges faced by workers
	the management of chemical risks is generally poorer. The report also expresses concern about multiple exposures on emerging biological, physical and psychosocial emerging risks. REACH may not adequately protect workers, because the risks of daily exposure are primarily assessed for industrial chemicals at higher tonnage thresholds, whereas the majority of chemicals to which workers are exposed are at the lower thresholds. Since the level of hazardous substance exposure for workers is at much higher levels than the permissible exposure levels for consumers, information about adverse effects of chronic exposure is critical. In Germany, 16,165 suspected cases of occupational skin disease were recorded in 2004, representing a quarter of all registered occupational diseases. Other skin diseases include chemical burns ranging from rashes to full thickness skin damage requiring grafts. Chromate is the most dominant allergen, followed by epoxy resins and cobalt in the German construction industry. The German trade union IG Bergbau, Chemie, Energie says that information needs to feature more prominently on the European Chemicals Agency database, so workers can better access health and safety information. Although asbestos is prohibited in Germany, it is still found in buildings and ships. Specialized training and qualifications are required to dispose of asbestos safely, for instance, in demolition or renovation, particularly for informal workers. It was brought to the Special Rapporteur's attention that Germany has not put in place any specific measures to protect informal workers from the risks of hazardous substances. Currently the trade union IG Bauen-Agrar-Umwelt is campaigning for informal and migrant workers to receive basic health and safety instructions prior to working. BASF informed the Special Rapporteur of its global standards for workers' safety. BASF assured the Special Rapporteur that all plants were built according to the same standards and safety levels for workers. The company's goal is to reduce work-related accidents by 80 per cent by 2020. In both areas of private liability — the Environmental Liability Act and Law on Pharmaceuticals — a shift in the burden of proof to reflect a victims-based approach is welcomed. However, in the area of occupational health and safety, the Special Rapporteur heard of the immense challenges still faced by workers who fall ill from toxic chemicals to access any remedy. The Special Rapporteur is particularly concerned that European Union business enterprises, beyond Germany businesses, are exporting their manufacturing activities — and the risks to workers of toxic chemicals — to developing countries. Post-production, European Union businesses can import a product that claims to be "free of hazardous substances" even though hazardous substances were used in the supply chain outside the European Union. This practice is comparable to the supply chain of clothing that originates, for example, from a garment factory in Bangladesh that fails to respect workers' rights, including against sexual violence, and unlawfully targets labour leaders with intimidation, threats and violence. It is also similar to the global trade and supply chain in cobalt, a key component in rechargeable lithium-	health • Failures to realize the right to information • Inaccessible remedies, justice and accountability • Opaque supply chains and the transfer of hazardous work • Restrained freedom of association • Inaccessible remedies, justice and accountability • Limited progress in prevention of exposure • Exploitation of those most at risk • Opaque supply chains and the transfer of

Report	*References to occupational exposures*	*Challenges faced by workers*
	ion batteries, which may originate from artisanal miners in the Democratic Republic of the Congo, including child labourers who suffer health consequences from prolonged exposure to cobalt without even the most basic protective equipment. These two examples also highlight one of the major problems of REACH where business enterprises are seriously challenged in tracing the use of industrial chemicals throughout the supply chain, despite the reporting requirements of the Regulation. Among the recommendations of the Special Rapporteur was one to increase information for marginalized persons and those in vulnerable situations, especially pregnant women and those who work or live with children, about protection measures, especially endocrine disrupting chemicals.	hazardous work • Exploitation of those most at risk • Failures to realize the right to information
"Pesticides and the right to food" **(A/HRC/34/48) (2017)** **(Report written in collaboration with the Special Rapporteur on the right to food)**	Human rights standards require States to protect vulnerable groups, such as farm workers and agricultural communities, children and women from the impacts of pesticides. Agricultural workers are routinely exposed to toxic pesticides via spray, drift or direct contact with treated crops or soil, from accidental spills or inadequate personal protective equipment. Even when following recommended safety precautions, those applying pesticides are subject to higher exposure levels. Families of agricultural workers are also vulnerable, as workers bring home pesticide residues on their skin, clothing and shoes. Studies in developed countries show that annual acute pesticide poisoning affects nearly 1 in every 5,000 agricultural workers. Globally, however, it is unknown what percentage of farmworkers experience acute pesticide poisoning owing to a lack of standardized reporting. Poor enforcement of labour regulations and lack of health and safety training can elevate exposure risks, while many Governments lack the infrastructure and resources to regulate and monitor pesticides. The exposure risk of children engaged in agricultural work is particularly alarming. Although little data are available, the International Labour Organization estimates that about 60 per cent of child labourers worldwide work in agriculture, and children often make up a substantial portion of the agricultural workforce in developing countries. Their increased sensitivity to the hazards of pesticides, the inadequacy of protective equipment and their lack of experience may leave them particularly exposed. Seasonal and migrant workers are also more vulnerable, as they may work temporarily at various agricultural sites, multiplying their exposure risk to pesticides. Language barriers may further prevent these workers from understanding labels and safety warnings, they may experience poor working conditions without access to adequate safety equipment and they may have difficulty accessing medical care and compensation for pesticide-related diseases. Workers may also have little control over the types of pesticides used.	• Inadequate standards of protection • Limited progress in prevention of exposure • Monitoring and enforcement gaps • Failures to realize the right to information • Inaccessible remedies, justice and accountability • Opaque supply chains and the transfer of hazardous work

Report	*References to occupational exposures*	*Challenges faced by workers*
"Guidelines for good practices in relation to the human rights obligations related to the environmentally sound management and disposal of hazardous substances and wastes" **(A/HRC/36/41) (2017)**	The Special Rapporteur articulates a human rights-based approach to hazardous substances and wastes, including pollutants, toxic industrial chemicals and pesticides, which requires a specific focus on the protection of those most vulnerable or at risk: children, the poor, workers, persons with disabilities, older persons, indigenous peoples, migrants and minorities, while taking into account gender-specific risks. Designing laws and policies to protect those most at risk has been shown to have a ripple effect for the broader community. States must ensure that laws, policies and institutions aimed at assessing and mitigating the potential impacts of toxics are based on the needs of the most vulnerable. In 2013, the International Labour Organization (ILO) estimated that nearly 2 million workers per year — between 3 and 4 workers per minute — die prematurely from occupational diseases linked to toxic chemicals.[5] Laws in most countries permit workers to be exposed to levels of toxic chemicals hundreds of times higher than the exposure allowed among the general public and often do not take into account real-world exposure scenarios or gender-specific and other sensitivities. Workers are frequently unable to exercise their right to freedom of association and collective bargaining, which is necessary to secure a healthy workplace. The report notes how information on toxics is essential in order to prevent adverse impacts, to ensure the realization of freedom of expression and to enable individuals and communities to participate in decision-making processes and to seek and obtain remedy. Health and safety information about toxic chemicals must never be confidential. Information must be available, accessible, functional and consistent with the principle of non-discrimination in order for human rights to be respected, protected, enjoyed and fulfilled. Despite notable improvements in many countries over recent decades, the right to information remains insufficiently realized in the area of hazardous substances and wastes, particularly with respect to protecting the most vulnerable from adverse impacts of exposure, whether from consumer products, at the workplace or via food, water, air or other sources. Workers should have the right to remove themselves from conditions they believe are unsafe, and the right to information regarding occupational health and safety. However, necessary information on safety precautions or health risks linked to toxic chemicals is often unavailable or inaccessible to workers. Information may be in a foreign language, and labelled pictures may be indecipherable or too small to be legible. States continue to allow the use of industrial chemicals and pesticides under the presumption that personal protective equipment will be used, and that it will be used as effectively as expected. However, workers often do not have access to necessary protective equipment of reasonable quality, and the conditions under which they are expected to use the equipment are often completely unreasonable; thus, risk assessments are inaccurate. Workers are exposed to substances whose health effects have not been studied adequately. Adverse health impacts from chronic occupational exposure to toxic chemicals may not manifest	• Inadequate standards of protection • Exploitation of those most at risk • Restrained freedom of association • Failures to realize the right to information • Limited progress in prevention of exposure • Inaccessible remedies, justice and accountability

[5] Updated figures are available in the present report at para. 3.

Report	*References to occupational exposures*	*Challenges faced by workers*
	as a disease for several years. Due to these and other factors, only a small percentage of workers have access to an effective remedy for violations of their rights.	
	Child labourers, female workers, migrant workers and residents of low-income communities are significantly more vulnerable to toxic impacts due to unique sensitivities, cumulative impacts or unequal protections under the law. One of the worst forms of child labour is that in which children work with, or are exposed to any level of, hazardous substances. The World Health Organization (WHO) has published studies showing that children who work with hazardous substances have shorter average lifespans. Children are also at risk through the transmission of their parents' occupational exposures, in particular from their mother while they are in the womb or through breast milk. States must ensure that workers are able to enjoy the right to safe and healthy working conditions. States must protect the right of workers to just, decent and favourable conditions of work by preventing occupational exposure to toxic chemicals, a right that is indivisible from the right to the highest attainable level of physical and mental health and the right to physical integrity. States must ensure that workers have access to information and effective remedy for violations; they must also ensure that migrant workers enjoy the same rights as nationals of the State of employment regarding protection from toxic exposure.	• Exploitation of those most at risk
	The report recommends States uphold human rights through legislation to protecting against infringements resulting from toxic exposures at work. Many States have established constitutional rights and legislation of direct relevance to toxics in the workplace. Legislation in place covers particular life-cycle stages, different types of substances, different product categories, information requirements and other aspects relevant to the State's duty to protect.	• Inadequate standards of protection • Limited progress in prevention of exposure
	The report recommends States translate evidence of potential impacts on the enjoyment of human rights into timely and effective measures to respect, protect and fulfil each right implicated. The ability to protect the human rights to life and to health and to realize the right to access to the benefits of scientific progress and its applications hinges upon the ability to translate evidence into protective laws and policies. As discussed above, States must make expeditious progress in the realization of the rights to life and to health, taking all possible measures to protect those rights. However, despite evidence of risks and impacts, there have been instances where the procedures of some States have enabled private interests to use scientific uncertainties as a basis for delaying action to reduce risks. This has led to extreme delays, some lasting decades, in translating evidence of hazard and risk into measures necessary to protect workers, children and others most at risk. This is an unfortunate exploitation of scientific uncertainty by private interests. Scientific uncertainty will always exist. Several States have adopted the principle of precaution to help ensure that action is taken despite those uncertainties. The principle of precaution is essential to the progressive realization of numerous human rights implicated by hazardous substances and wastes.	• Deliberate efforts to delay or obstruct protection from toxic exposure
	The report notes that businesses should identify and assess the actual and potential adverse human rights impacts in which they may be involved either through their own activities or as a result of their business relationships. They should identify actual and potential impacts throughout the life	• Limited progress in prevention of

Report	References to occupational exposures	Challenges faced by workers
	cycle of their products, including supply and value chains. Traceability of supply chains and the life cycle of products is essential to identifying human rights abuses linked to the exposure of workers and communities to toxics.	exposure • Monitoring and enforcement gaps
	The importance of the supply and value chain and a lifecycle approach is emphasized in terms of the protection of human rights from toxic exposures. In addition to the pesticide manufacturers, downstream businesses are implicated in the value chain of food and agricultural production in which such hazardous substances are used. For example, according to UNICEF, "exposure to toxic chemicals is likely to be the single greatest health risk to pregnant and nursing workers in the palm oil sector". Approximately 50 per cent of all consumer products around the world use palm oil, implicating large numbers of consumer product companies.	• Opaque supply chains and the transfer of hazardous work
	Air pollution is also of grave concern to child, women and older workers as well as local communities. Illnesses related to haze resulting from the clearing of forests and peat lands for palm plantations not only affect workers and communities near plantations, but can have transboundary impacts. Although the burning of forests and the use of certain pesticides are illegal, compliance and enforcement is poor and such practices continue. Other food and agriculture sectors noted as facing challenges in preventing human rights abuses include coffee, cocoa, cotton and tobacco production.	
	The Special Rapporteur notes that hazardous substances continue to be used in the manufacturing sector and as components of a variety of consumer products, implicating the rights of workers, local communities and consumers, as well as the rights of those who may be exposed to postconsumer waste. Concerns about human rights abuses linked to toxic chemicals have been raised in the context of the electronics sector and the textile, leather and other garment industries. Researchers have also identified a myriad of adverse health impacts linked to toxic chemicals in cosmetics, personal care products, cleaning products, detergents and other household consumer products.	• Inadequate standards of protection
	Retailers are able to demand compliance with human rights from their suppliers upstream to ensure that no community, consumer or worker suffers abuses due to hazardous substances linked to products they sell. Indeed, in response to consumer demands for products free of toxic chemicals and for ethical conduct by businesses, certain retailers are exceeding the standards provided by national and international laws. For example, retailers have prohibited the inclusion of certain chemicals of concern in their products.	• Opaque supply chains and the transfer of hazardous work
	The guidelines for good practices are intended to assist States in ensuring that their laws and other practices are in line with their human rights obligations. In this vein, the Special Rapporteur recommended that States and other stakeholders apply a number of principles, including that: States must ensure that their practices relating to hazardous substances and wastes ensure equality, do not discriminate against any vulnerable group, including children, the poor, workers, persons with disabilities, older persons, indigenous peoples, migrants and minorities, and take into account gender-specific risks.	• Inadequate standards of protection • Exploitation of those most at risk

Report	*References to occupational exposures*	*Challenges faced by workers*
"Mission to the United Kingdom of Great Britain and Northern Ireland" **(A/HRC/36/41/Add.1) (2017)**	The mission of the Special Rapporteur to the U.K. examined several worker rights-related issues. For workers who develop diseases from exposures to toxic chemicals at work, compensation, health care and other aspects of their right to an effective remedy can very often be unattainable. It is calculated that less than 1 per cent of sick workers receive compensation in the United Kingdom for non-asbestos-related occupational diseases. While the Health and Safety Executive has conservatively estimated that approximately 13,000 new cases of occupational disease arise each year, including cancers related to chemical exposure, alarming shortcomings in the United Kingdom compensatory system exclude many claimants due to disability thresholds, minimum exposure times and lack of recognition of elevated risks due to multiple exposures. The United Kingdom Industrial Injuries Advisory Council generally imposes a non-legal, non-scientific "relative risk" test, which requires that the condition be twice as common in the affected group as in the general population. Considering that this threshold is very difficult to meet, fewer occupational diseases are officially recognized in the United Kingdom compared with other countries that apply different criteria. In an example dating back to the 1980s, farmers and agricultural workers who believe they were affected by the use of organophosphate-based or "OP" pesticides in sheep dipping activities have faced severe difficulties in accessing an effective remedy. At the time, the United Kingdom Government ran a mandatory programme requiring farmers to chemically treat their sheep with pesticides to combat sheep scab. Most farmers used organophosphate-based dips to comply, as they were the only licensed products available initially. Organophosphate compounds were initially developed as neurotoxic chemical warfare agents due to their ability to inhibit blood cholinesterase activity. Over the next two decades, farmers reported a range of debilitating health problems, which they believed to be the result of poisoning from the organophosphate-based products, with symptoms including nausea, anxiety, pulmonary oedema and long-term neurological damage. Victim support groups compiled a list of more than 500 farmers believed to have suffered from ill health as a result of their exposure, although campaigners claim the real number to run in the thousands. Victims struggled to access appropriate treatment under the public health regime, as organophosphate poisoning was not considered to be a medical condition. Some were allegedly wrongly diagnosed as suffering from psychological issues and given medications that exacerbated their suffering. A number of individuals who were medically tested by the Government claim they experienced serious difficulties in obtaining the release of their medical records. The difficulty in establishing causation between chronic ill health and the use of organophosphate-based pesticides has seen many legal claims fail. In 2015, an internal report of the Health and Safety Executive of May 1991 was released under a freedom of information request, which established that government officials had warned of the dangers of exposure to organophosphate-based pesticides. Yet in the same month, the Minister of Farming demanded that local authorities clamp down on farmers who refused to use the chemical. The release of the internal report triggered calls by more than a dozen Members of Parliament for	• Inaccessible remedies, justice and accountability • Deliberate efforts to delay or obstruct protection from toxic exposure • Failures to realize the right to information • Limited progress in prevention of exposure

Report	References to occupational exposures	Challenges faced by workers
	an inquiry and public debate into whether farmers were misled over the use of organophosphate-based pesticides. Officials of the Department for Environment, Food and Rural Affairs explained that no precaution could ever offer 100 per cent protection from any exposure to organophosphate-based pesticides, and explained the difficulty in predicting exposure levels. In the May 1991 report, manufacturers of the sheep-dipping chemicals were criticized for providing inadequate protective measures and instructions for the use of the product. At the time, legislation and guidance to ensure the protection of agricultural workers using the organophosphate-based pesticides placed the burden on farmers to protect themselves. Since 1995, the sale and supply of organophosphate-based pesticides have been restricted to appropriately trained and certified users. The Veterinary Medicines Regulations 2006 introduced a requirement for sheep dipping to be supervised by a holder of a certificate of competence. The United Kingdom Government stated that it has invested a considerable amount of time and public money to understand all the risks relating to those compounds and determine how they could be minimized, and that it has been unable to identify any causal link between exposure to organophosphate-based pesticides and the symptoms reported. The Special Rapporteur was also referred to a statement on organophosphates issued by the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment in 2014, which concluded that exposures to cholinesterase-inhibiting organophosphates that are insufficient to cause overt acute poisoning do not cause important long-term neurological toxicity in adults. However, a number of medical experts have spoken out about the use of organophosphate-based sheep dips and the high number of incidents of chronic ill health within the farming community. One independent study, which reviewed the available evidence concerning the neurotoxicity of low-level occupational exposure to organophosphate-based pesticides, found that 13 out of 16 studies showed evidence of neurological problems following long-term, low-level exposure. The United Kingdom Government stated that the Committee had reviewed this study, reaching its conclusion in 2014.	
	While the United Kingdom has certain specific laws and common law rules to protect human rights in the context of business activities, for example the Health and Safety at Work Act 1974 and the Gangmasters (Licensing) Act 2004, comprehensive legislation to hold businesses to account for human rights abuses is lacking. While legislation provides for the criminal prosecution of a business enterprise, it is very difficult to prove the intent of a business, and the criminal justice system tends to focus on individual criminal liability, which can be difficult to attribute to a company. The Parliamentary Joint Committee on Human Rights, mandated to examine human rights matters within the United Kingdom, has recommended that the Government bring forward legislation to impose a duty on all companies, including parent companies, to prevent human rights abuses, with failure to do so becoming an offence, as under the Bribery Act 2010. The United Kingdom also appears to suffer from insufficient expertise and resources to efficiently combat corporate crime. The Special Rapporteur made a number of recommendations to the Government, including one	• Inadequate standards of protection • Limited progress in prevention of exposure • Inaccessible remedies, justice and accountability

Report	*References to occupational exposures*	*Challenges faced by workers*
	that the Government examine the obstacles to the right to effective remedy by workers and other victims suffering from toxic exposure, including causation, and ensure that victims of United Kingdom companies operating abroad are able to access justice and remedy in the United Kingdom.	
"Mission to Sierra Leone" **(Mission carried out in 2017)**	During his country visit to Sierra Leone, the Special Rapporteur met local residents and workers, paying particular attention on the impact of the agriculture, mining and waste sectors on workers and their communities. The Special Rapporteur noted with concern issues regarding workers in agriculture and mining sectors. The agriculture sector is linked with challenges including in relation to the monitoring and use of agro chemicals and their potential impact on agriculture workers communities living around areas where chemicals are used and the potential contamination of food and water sources. A study on the use of pesticides in Sierra Leone rice crops provided very concerning results.[6] In his visit to rural communities, the Special Rapporteur heard complaints of contamination potentially related to the activities of business enterprises engaged in large-scale oil palm farming.	• Inadequate standards of protection • Limited progress in prevention of exposure • Monitoring and enforcement gaps • Exploitation of those most at risk • Informal economy • Disconnected efforts on occupational and environmental health • Failures to realize the right to information
"Mission to Denmark" **(Mission carried out in 2017)**	During his country visit to Denmark, the Special Rapporteur was informed on concerns regarding potential health impacts of antibiotic use in livestock. These antibiotics increase the potential of spreading of Associated Methycillin Resistant Streptococcus Aureus (LA-MRSA or MRSA) CC398, an antibiotic resistant 'superbug', in the food chain, and among workers exposed to the raw pork.[7] The Special Rapporteur remains seriously concerned by the vast human health consequences of antimicrobial resistance on workers and more broadly.[8] The Special Rapporteur acknowledges the efforts of Denmark in promoting occupational safety	• Inadequate standards of protection • Limited progress in prevention of exposure • Exploitation of

[6] http://eprints.lancs.ac.uk/80079/1/ENVINT_D_16_00107.pdf.

[7] See https://countercurrents.org/2017/03/13/the-pig-industry-and-the-usage-of-antibiotics-in-denmark/.

[8] http://www.who.int/drugresistance/documents/surveillancereport/en/.

Report	References to occupational exposures	Challenges faced by workers
	and health through cooperation with other governments, to which he attaches great importance given the transnational production and disposal chains of Danish businesses. Among other activities, a 2016 project in Bangladesh established an expert group on Occupational Safety and Health (OSH Unit), in the Department for Inspection of Factories and Establishments (DIFE) of the Government of Bangladesh. The Special Rapporteur welcomes this cooperation and. However, the Special Rapporteur was disappointed to note that cooperation efforts on the protection of workers did not include support to the shipbreaking industry in Bangladesh or elsewhere, despite the substantial impacts of Danish businesses in this sector on the rights of foreign workers. The Special Rapporteur encourages further efforts to ensure all Danish businesses ensure all workers are protected from exposure to toxic substances in their supply chains, among other concerns for workers' rights.	those most at risk • Opaque supply chains and the transfer of hazardous work • Failures to realize the right to information
	The Special Rapporteur was disturbed by the lack of attention to the continued exportation of hazardous pesticides banned by Denmark to countries that have lower levels of protection against the adverse impacts of such pesticides on the human right to health, among others. In some cases, products produced with such banned pesticides and other toxic chemicals can be imported back into Denmark.	• Limited progress in prevention of exposure • Exploitation of those most at risk
	The Danish company Cheminova is one of the main producers of one such pesticide, Malathion, an insecticide to be used against chewing and sucking insect pests in crops. Evidence is publicly available on the serious risks posed by Malathion to the environment, especially water sources and biodiversity and to human health.[9] An analysis conducted in 2016 by the World Health Organization International Agency for Research on Cancer (IARC)[10] concluded that Malathion is probably carcinogenic to humans while identifying strong evidence that exposure to malathion-based pesticides is genotoxic. For these reasons Malathion is not commercialized in the EU, including Denmark. Yet, only in 2017, Cheminova A/S, a multinational pesticide producer based in Denmark exported Malathion to over 40 countries outside the EU.[11] In 2015, the Special Rapporteur expressed his concerns on the *extreme impacts on the rights* to food and water, and livelihoods of communities in Guatemala, when 500 to 1000 kg of fish were killed in Peten River, Guatemala, reportedly due to the heavy contamination of local waters by Malathion.[12] The practices of Cheminova in countries with weaker normative frameworks have been criticized in the past.[13]	• Opaque supply chains and the transfer of hazardous work

[9] http://www.pesticideinfo.org/Detail_Chemical.jsp?Rec_Id=PC32924.

[10] https://monographs.iarc.fr/ENG/Monographs/vol112/mono112-07.pdf.

[11] See Export Notifications, European Chemical Agency.

[12] See GTM 4/2015.

[13] Pesticide export to institutionally vulnerable countries, who is responsible? An assessment of the practices and strategies of a Danish company in Brazil.

Report	*References to occupational exposures*	*Challenges faced by workers*
	The exposure of communities and workers in States with weaker regulations to chemicals banned in Europe is an unacceptable demonstration of double standards.[14] As previously addressed, additional legal instruments should be considered in Denmark in order to ensure companies respect human rights throughout their operations and conduct human rights due diligence in relation to their domestic and international operations and supply chains, always using the highest levels or protection when operating in different jurisdictions. In Greenland, controversy marked the implementation of military activities especially due to the difficulties in accessing information on the full nature of operations implemented by the US forces. Concerns existed, for example, on the impact of the contamination generated by the crash near of a US B-52 bomber loaded with nuclear weapons near the Thule Aribase. The local workers involved in the clean-up operation claimed long-term health problems resulted from their exposure to the radiation and legally challenged the Danish Government for allegedly failing to monitor the health consequences of their exposure to toxics. \ The Special Rapporteur also noted the potential adverse health risks for workers who may be employed in the developing mining industry of Greenland.	• Inadequate standards of protection • Limited progress in prevention of exposure • Monitoring and enforcement gaps • Exploitation of those most at risk • Failures to realize the right to information • Inaccessible remedies, justice and accountability
"Shipbreaking": Government of the United Kingdom, Government of Denmark, the Government of Brazil, and the Government of Bangladesh, and 2 companies (North Sea Production Company, A.P. Moeller Maersk, and	In January 2018, the Special Rapporteur and the Working Group on Business and Human Rights brought to the attention of the Government of the United Kingdom, Government of Denmark, the Government of Brazil, and the Government of Bangladesh information received concerning the alleged transboundary movement of The North Sea Producer, an end-of-life ship owned by the UK registered North Sea Production Company, a single-ship joint venture between the A.P. Moeller Maersk (headquartered in Denmark) and Odebrecht (headquartered in Brazil) The ship, containing hazardous substances and wastes, arrived in August 2016 in Chittagong, Bangladesh for dismantling (shipbreaking). A similar letter was also addressed to the companies involved. At the yard where the North Sea Producer was supposed to be dismantled, shipbreaking work is carried out without workers having access to necessary safety equipment as well as use of proper safety and procedures. Work reportedly is carried out manually by workers with torch cutters.	• Inadequate standards of protection • Limited progress in prevention of exposure • Monitoring and enforcement gaps • Exploitation of

[14] A/HRC/33/41/Add.2 — include UK mission, pesticides report by SR food

Report	*References to occupational exposures*	*Challenges faced by workers*
Odebrecht) **(2018)**	Oxygen and gas are pumped through a device that creates a 1500°C flame that can cut through steel coated with paints that contain hazardous substances such as heavy metals. Reports also indicate that workers do not use necessary protective clothing, some moving with bare feet and sandals in the tidal mudflat used as the dismantling area. Most workers live in unhealthy conditions in wood and sheet metal shacks right next to the walls of the shipyard. Coughs, headache and breathing problems are reported among workers in dismantling yards in the same area in Bangladesh. Apart from highlighting the poor working conditions of the workers, this issue also exhibited the challenges in realizing the right to decent work, including transfer of hazardous work to developing countries, exploitation of those most at risk (migrant workers), capitalizing on the informal sector to skirt international obligations, as well as what may amount to deliberate efforts by business enterprises to delay or obstruct protection from toxic exposure of workers.	those most at risk • Informal economy • Deliberate efforts to delay or obstruct protection from toxic exposure • Opaque supply chains and the transfer of hazardous work
"Electronics Industry": Government of the People's Republic of China, Government of the United States of America, and 2 companies (Catcher Technology Co. Ltd. and Apple Inc.) **(2018)**	In May 2018, the Special Rapporteur and others brought to the attention of the Government of the People's Republic of China information received concerning the alleged unsafe working conditions at Catcher Technology's factory in Suqian, northern Jiangsu Province, People's Republic of China, and the implications for the human rights of the affected workers. A similar communication was also addressed to the Government of the USA and two companies: Catcher Technology Co Ltd and Apple Inc. At the time of drafting this report, there were no responses received from the Governments regarding the allegations. Catcher Technology Co Ltd. (Catcher), headquartered in Taiwan, Province of China, is a world leader in the light metal industry, specializing in notebook computers, digital cameras, and disc drives. Catcher manufactures products for many well-known consumer electronics companies including Apple Inc. (Apple), an American technology company headquartered in Cupertino, California, United States of America. This communication highlighted various challenges faced by workers in relation to their health and exposure to hazardous substances and wastes including: The exposure of workers to hazardous substances and polluted indoor air: On 25 May 2017, an incident of toxic gas poisoning at the A6 workshop of the factory resulted in the hospitalization of 90 workers, with five workers admitted to intensive care. An investigation conducted by the Administrative Committee of the Suzhou-Suqian Industrial Park confirmed that poisonous gas permeated throughout the workshop, triggering adverse reactions among operator personnel. In addition, there is severe indoor air pollution at the factory, with some workers suffering from respiratory illnesses as a result. Workers are at risk of other health and safety hazards: The surface of the factory floor is often covered in oil, resulting in instances of workers slipping and falling. In addition, workers at the Computer Numerical Control (CNC) machining workshop of the factory are exposed to excessive loud noise, placing them at risk of irreversible hearing loss. In addition, the main door of the CNC machining workshop only opens 30 cm wide, posing a safety hazard, particularly in case of emergencies.	• Inadequate standards of protection • Opaque supply chains and the transfer of hazardous work • Limited progress in prevention of exposure • Failures to realize the right to information • Inaccessible remedies, justice and accountability

Report	*References to occupational exposures*	*Challenges faced by workers*

Workers' right to information is not protected: The workers have insufficient information regarding the toxic substances they handle or could be exposed to and their potential hazards. For instance, workers are inadequately informed of the hazards of exposure to cutting fluid and of any relevant protection methods. While factory regulations require providing a 24-hour training to workers prior to starting work, the training offered is neither adequate nor effective. Training sessions are frequently less than an hour long and workers are handed questionnaires, the answers to which are read out by the staff. Such a practice restricts workers from fully understanding the nature and potential hazards of the toxic substance they handle or could be exposed to. Furthermore, information is not available regarding the exposure levels of workers to various toxic chemicals that are commonly used in electronics production and relevant information about the use of toxic chemicals at the factory.

Workers are not provided with adequate Personal Protective Equipment (PPE): Excluding some workers who wear glasses, all other workers in the workshop operate machinery with no eye protection. The CNC machining workshop provides workers with a pair each of rubber and cotton gloves every day. However, the cotton gloves appear to be have been previously used as they would be given to the workers while they were already damp and water-stained. The cutting fluid which CNC machine operators come into contact with is absorbed quickly by the cotton gloves along with other chemicals, oils, and fluids, thus eroding the rubber gloves worn inside. This results in the workers' hands making direct contact with the cotton gloves soaked in cutting fluid. The inadequate equipment has resulted in irritation and peeling off of skin on the hands of many workers. In addition, for workers who use pressure guns in the production process, the cutting oil splashes onto their heads. Single-use paper face masks provided by the factory only protect the workers' mouths and faces and the cutting fluid often splashes into the workers' eyes resulting in complications like eye pain, blurred vision and bloodshot eyes for prolonged periods.

Workers face inadequate access to health and sanitation facilities: Workers at the factory are responsible for paying for their physical examinations. Workers do not undergo physical examinations after they resign making it difficult to determine if they have contracted an occupational disease as a result of working at the factory. Workers applying through labour dispatch companies are not given social insurance during their probationary work period. Workers do not have access to healthcare services and have to pay for any occupational treatment out of pocket for the first three months of work, as Catcher only distributes social insurance cards three months after the contract commences. While there is legal provision for access to treatment for occupational illnesses, many workers remain vulnerable due to inadequate access to contractual documents from the employer, insufficient or lack of regular health checks for workers, and unsatisfactory or lack of workplace evaluations which would be evidence for the worker to prove the link between exposure and the illness.

The bathrooms in the factory's housing area do not have adequate hot water facilities even during the winter. Workers have on occasion fallen ill due to inadequate heating and insufficient shelter from the wind in the shower areas. There are also no emergency hallways or exits in the workers'

Report	References to occupational exposures	Challenges faced by workers
	dormitories. The food provided to workers is unsanitary: For instance, there have been many occasions where workers have suffered from diarrhoea after eating at the factory cafeteria. The factory does not permit workers to leave the factory area during lunchtime and workers therefore cannot purchase their own food.	
"Tobacco industry": Government of Zimbabwe, **10 companies and the Governments of their countries of domicile** **Companies:** **Alliance Once International Inc.** **British American Tobacco (BAT) PLC** **Chidziva Tobacco Processors (Private) Limited** **China National Tobacco Corporation & Tian Ze Tobacco Company** **Contraf Nicotex Tobacco GmbH (CNT)** **Imperial Brands PLC** **Japan Tobacco Inc & Japan International SA** **Northern Tobacco (Private) Limited** **Premium Tobacco International DMCC** **Universal Corporation**	In May 2018, the Special Rapporteur and others brought to the attention of the Government of Zimbabwe information received concerning alleged human rights violations resulting from exposure of workers including children, to toxic chemicals while working in tobacco farming farms in Zimbabwe, specifically in Mashonaland West, Mashonaland Central, Mashonaland East, and Manicaland. A similar communication was also addressed to 10 companies and to the Governments of their countries of domicile. At the time of drafting this report, there were no responses received from the Governments regarding the allegations. In 2018, there are approximately 100,000 registered tobacco farmers, comprising both large-scale and small-scale farmers. It is alleged that workers involved in tobacco production in Zimbabwe face serious health and safety risks. Workers allegedly have insufficient information, training, and equipment to protect themselves from exposure to pesticides and other toxic chemicals. Reports of workers hired on large-scale farms suggest that many workers, including some children, are coerced into working hours that are in excess of agreed time without overtime compensation. Some workers allege that they are denied their wages and forced to go weeks or months without pay. Workers who have refused to work overtime without additional pay have allegedly been dismissed or have been threatened with dismissal. Workers reportedly suffer from nausea, vomiting, loss of appetite, stomach pain, headaches, dizziness, skin irritation (particularly of the face), chest pain, blurred vision, eye irritation, respiratory irritation, and other symptoms of Green Tobacco Sickness (GTS), a type of nicotine poisoning that occurs while handling tobacco plants. Some of these adverse health impacts are reportedly developed from the application of pesticides on the tobacco farms. Long-term and chronic health effects of pesticide exposure include respiratory problems, cancer, depression, neurologic deficits, and reproductive health problems. It is reported that neither government officials nor company representatives have provided workers with adequate information about nicotine poisoning and pesticide exposure, or with sufficient training or comprehensive education to protect themselves. Some workers reportedly are not provided with, and often lack the means to procure equipment necessary to protect themselves, despite legal provision requiring employers to ensure that workers handling hazardous substances, including pesticides, are informed about the risks of the work, and provided with proper protective equipment. It is alleged that in the tobacco industry in Zimbabwe children are involved in work on farms and other parts of the production process and do so in hazardous conditions, often performing tasks that threaten their health and safety or interfere with their education. It is reported that during the	• Opaque supply chains and the transfer of hazardous work • Exploitation of those most at risk • Informal economy • Inadequate standards of protection • Limited progress in prevention of exposure • Failures to realize the right to information

Report	*References to occupational exposures*	*Challenges faced by workers*
Countries of domicile: **Germany** **Japan** **People's Republic of China** **Switzerland** **United Arab Emirates** **United Kingdom** **United States of America (2018)**	labour-intensive planting and harvesting seasons, high rates of absenteeism are recorded in schools near tobacco farms as children are engaged in work either as individuals or as part of their families. Children are allegedly exposed to pesticides while working on tobacco farms in Zimbabwe. Some children mix, handle, or apply pesticides directly. Others are exposed when pesticides are applied to areas close to where they were working, or by re-entering fields that had been very recently sprayed. Many children report immediate illness after having contact with pesticides. It is further reported that children work long hours handling green or dried tobacco leaves and as a result suffer specific symptoms associated with acute nicotine poisoning and pesticide exposure. Allegedly, the symptoms of GTS are clearly visible in child labourers, and monitoring systems are inadequate to detect health impacts of chronic exposure to pesticides and other toxic chemicals.	